MOL.19980203.0529

CRWMS/M&O

Design Analysis Cover Sheet

Complete only applicable items.

(1.)

QA: L

Page: 1 Of: 75

2. DESIGN ANALYSIS TITLE Preliminary Design Basis for WP Thermal Analysis			
3. DOCUMENT IDENTIFIER (Including Rev. No.) BBAA00000-01717-0200-00019 REV 00			4. TOTAL PAGES 75
5. TOTAL ATTACHMENTS 77	6. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH Total: ~~446~~ 522 RHBIII 10/30/97 pages; See Table 9-1 (p. 73) for attachment numbers and page count		
	Printed Name	Signature	Date
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11. REMARKS

QAP-3-9 (Effective 06/02/97)

0492 (Rev. 03/10/97)

9902240362 990107
PDR WASTE
WM-11 PDR

Part 1

CRWMS/M&O

Design Analysis Revision Record

Complete only applicable items.

1.

2. DESIGN ANALYSIS TITLE

Preliminary Design Basis for WP Thermal Analysis

3. DOCUMENT IDENTIFIER (Including Rev. No.)

BBAA00000-01717-0200-00019 REV 00

4. Revision No.	5. Description of Revision
00	Issued Approved

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1. Purpose

The purpose of this analysis is to determine the design basis commercial spent nuclear fuel (SNF) decay heat to be used in subsequent thermal analyses of the waste package and its internal and near-field environment. This analysis, prepared by the Mined Geologic Disposal System (MGDS) Waste Package Development Department (WPDD), will provide tables of SNF heat as a function of time for each waste package (WP) design that represent both the average assembly heat outputs and the heat of the design basis assembly. The four main objectives of the analysis are to determine: 1) the appropriate design basis fuel characteristics to assume for WP thermal analysis, 2) the average fuel characteristics for each WP design based on reasonable design basis waste streams, 3) the nominal characteristics of canistered high-level waste (HLW) glass, and 4) the appropriate implementation of these waste form characteristics into assumptions for thermal loading of the potential repository at Yucca Mountain. This information will provide the base assumptions used to develop thermal analyses of the waste package, its support structures, and the waste forms.

2. Quality Assurance

The Quality Assurance (QA) program applies to this analysis. The work reported in this document is part of the preliminary WP design analysis that will eventually support the License Application Design phase. This activity, when appropriately confirmed, can impact the proper functioning of the Mined Geologic Disposal System waste package; the waste package has been identified as an MGDS Q-List item important to safety and waste isolation (pp. 4, 15, Ref. 5.1). The waste package is on the Q-List by direct inclusion by the Department of Energy (DOE), without conducting a QAP-2-3 evaluation. The Waste Package Development Department responsible manager has evaluated the design basis fuel development activity in accordance with QAP-2-0, *Conduct of Activities*. The "Perform Waste Stream Analysis to Determine Design Basis Fuel" (Ref. 5.2) evaluation has determined that the preparation and review of this design analysis is subject to *Quality Assurance Requirements and Description* (QARD; Ref. 5.3) requirements. As specified in NLP-3-18, this activity is subject to QA controls.

All design inputs which are identified in this document are for the preliminary stage of the WP design process; all of these design inputs, excluding the codes and standards, will require subsequent confirmation (or superseding inputs) as the waste package design proceeds. Consequently, the use of any data from this analysis for input into documents supporting construction, fabrication, or procurement is required to be controlled and tracked as TBV or TBD in accordance with NLP-3-15 or other appropriate procedures.

3. Method

Previous design basis fuel analyses (Refs. 5.18 and 5.19) have been developed utilizing a statistical analysis of the SNF characteristics projected for the first repository. Design basis SNF characteristics were selected that represented a specific portion of the waste inventory (such as an assumed coverage goal of 80%, for example). The resulting design basis characteristics produced arbitrary SNF parameters such as total heat output or criticality potential which are key impacts to the WP design. In this design analysis, and the preceding analysis of WP design configurations (Ref. 5.11), a reasonable design target based on WP performance characteristics (such as heat removal ability) has been selected. Then, a range of SNF characteristics can be identified that meet or are below the target design parameter value. This determination forms the basis of the WP loading constraints for each proposed WP design and separates the specification of design basis fuel from the constantly changing assumptions used to develop the proposed repository waste streams.

In this analysis, a single set of thermal design basis SNF characteristics are selected for each WP design option. Several SNF characteristics options that represent the assembly heat output design goal are compared, and one is selected based upon engineering judgement. Average assembly heat outputs for each WP design are also calculated using the assembly characteristics and receipt predictions from several reasonable waste streams. Nominal decay heat outputs from defense high-level waste containers are also presented for completeness. Suggested methodologies for the determination of repository thermal loading are compared and contrasted, with recommendations for future analyses.

4. Design Inputs

All design inputs which are identified in this document are for the preliminary stage of the design process; all of these design inputs, excluding the codes and standards, will require subsequent confirmation (or superseding inputs) as the waste package design proceeds. Consequently, the use of any data from this analysis for input into documents supporting construction, fabrication, or procurement is required to be controlled and tracked as TBV or TBD in accordance with NLP-3-15 or other appropriate procedures.

4.1 Design Parameters

Recommended WP design configurations are provided in Reference 5.11. That analysis set the capacity of the WP designs and the number of different WP design types which will be required to handle 100% of the anticipated commercial SNF waste stream. The selected design basis WP system configurations are presented here in Table 4.1-1 and the rationale supporting the selection is provided in the design configuration analysis (Ref. 5.11).

Table 4.1-1. Design Basis WP System Configuration Waste Stream Coverage

Case L1-T4-C1 (See Section 7.7, Ref 5.11) WP Types:	ID:	Assembly Heat Range (W)		Assembly Criticality Range		Coverage Range	
		Hmin	Hmax	k_∞min	k_∞max	# of WPs	% of PWR or BWR SNF
21 PWR - No Absorber (base thermal & criticality)	1	0	850	0.00	1.00	1375 to 1835	26.9 to 40.6%
21 PWR - Absorber Plates (criticality option 1)	2	0	850	1.00	1.13	2399 to 3596	53.1% to 58.1%
21 PWR - Absorber Rods, No Plates (criticality option 2)	3	0	850	1.13	1.45	119 to 257	2.6% to 4.1%
12 PWR - No Absorber (thermal option 1)	4	850	1370 (or 1500)	0.00	1.02	80 to 850	1.0% to 7.7%
12 PWR - Long, Absorber Plates (base South Texas long WP)	5	0	1370 (or 1500)	0.00	1.13	150 to 272	1.9% to 2.5%
44 BWR - No Absorber (base thermal & criticality)	6	0	400	0.00	1.00	695 to 997	24.6% to 30.3%
44 BWR - Absorber Plates (criticality option 1)	7	0	400	1.00	1.37	1942 to 2704	68.2% to 74.6%
24 BWR - Thick Absorber Plates (thermal option 1, criticality option 2)	8	0	520	0.00	1.54	40 to 197	0.8% to 2.8%

The design configuration evaluation determined: 1) the number of different types of WP needed, 2) the capacity of each WP type, and 3) the SNF parameters which provide the limits for each WP type. The information determines the scope of the WP design efforts and provide goals for the determination of design basis fuel types, for both pressurized water reactor (PWR) and boiling water reactor (BWR) SNF, for thermal design basis analysis presented here. As discussed in the design configuration evaluation (p. 29, Ref. 5.11), the 12 PWR assembly WP type can be designed to accept PWR assemblies with a 1500 W/assembly heat rate or less given a total WP heat load limit of 18 kW. The change from 1370 W/assembly to 1500 W/assembly is assumed for this analysis (see Assumption 4.3.1), and will not significantly affect the WP coverage (for the first 63,000 MTUs of SNF) for the WP system reported in Table 4.1-1. A 1500 watt limit will provide significant additional capacity to handle non-standard PWR SNF assemblies for the waste stream cases with the full 86,800 MTUs of SNF.

The B&W 15x15 assembly type is used as the basis for the design basis PWR SNF characteristics (see Section 7.2 and Assumption 4.3.3). The physical dimensions of the B&W Mark B4 PWR fuel assembly are listed in Table 4.1-2 and are taken from page 2A-7 of Reference 5.16 and page 2.1.2.2-6 (Table 2.5) of Reference 5.17.

Table 4.1-2. B&W 15x15 PWR Assembly Dimensions

Number of Rods	208	(p. 2A-7, Ref. 5.16)
Rod Pitch	14.43 mm (0.568 in.)	(p. 2A-7, Ref. 5.16)
UO_2 Pellet Diameter	9.36 mm (0.3686 in.)	(p. 2A-7, Ref. 5.16)
Cladding Outer Diameter	10.92 mm (0.430 in.)	(p. 2A-7, Ref. 5.16)
Cladding Thickness	0.673 mm (0.0265 in.)	(p. 2A-7, Ref. 5.16)
Number of Guide Tubes	16	(p. 2.1.2.2-6, Ref. 5.17)
Guide Tube Outer Diameter	13.46 mm (0.530 in.)	(p. 2.1.2.2-6, Ref. 5.17)
Guide Tube Thickness	0.406 mm (0.016 in.)	(p. 2.1.2.2-6, Ref. 5.17)
Instrument Tube Outer Diameter	12.52 mm (0.493 in.)	(p. 2.1.2.2-6, Ref. 5.17)
Active Fuel Length	3601.7 mm (141.8 in.)	(p. 2A-7, Ref. 5.16)
Uranium per Assembly	464 kg	(p. 2A-7, Ref. 5.16)

The Westinghouse 17x17 South Texas assembly type is used as the basis for the design basis South Texas SNF characteristics (see Section 7.2 and Assumption 4.3.4). The physical dimensions of the Westinghouse South Texas PWR fuel assembly are listed in Table 4.1-3 and are taken from pages 2A-30 and 2A-32 of Reference 5.16, page 2.1.2.2-3 (Table 2.2) of Reference 5.17, page 4.1-7 of Reference 5.32, and Assumption 4.3.4.

Table 4.1-3. Westinghouse 17x17 South Texas PWR Assembly Dimensions

Number of Rods	264 *	(p. 2A-30, Ref. 5.16)
Rod Pitch	12.60 mm (0.496 in.)	(p. 2A-32, Ref. 5.16)
UO_2 Pellet Diameter	8.18 mm (0.322 in.)	(p. 2A-32, Ref. 5.16)
Cladding Outer Diameter	9.50 mm (0.374 in.)	(p. 2A-32, Ref. 5.16)
Cladding Thickness	0.572 mm (0.0225 in.)	(p. 2A-32, Ref. 5.16)
Number of Guide Tubes	24 *	(p. 2.1.2.2-3, Ref. 5.17)
Guide Tube Outer Diameter	12.04 mm (0.474 in.)	(p. 2.1.2.2-3, Ref. 5.17)
Guide Tube Thickness	0.406 mm (0.016 in.)	(p. 2.1.2.2-3, Ref. 5.17)
Instrument Tube Outer Diameter	12.19 mm (0.480 in.)	(p. 2.1.2.2-3, Ref. 5.17)
Active Fuel Length	4267.2 mm (168.0 in.)	(p. 4.1-7, Ref. 5.32)
Uranium per Assembly	544 kg	(see Section 7.2.1.2)

* See Assumption 4.3.4

The GE-5 8x8 assembly type is used as the basis for the design basis BWR SNF characteristics (see Section 7.2 and Assumption 4.3.5). The physical dimensions of the GE-5 8x8 BWR fuel assembly are listed in Table 4.1-4 and are taken from page 2A-21 of Reference 5.16, page 6-10 of Reference 5.28, and page 13 (Table 4.1-7) of Reference 5.29.

Table 4.1-4. GE-5 8x8 BWR Assembly Dimensions

Number of Rods	62	(p. 2A-21, Ref. 5.16)
Rod Pitch	16.26 mm (0.640 in.)	(p. 2A-21, Ref. 5.16)
UO_2 Pellet Diameter	10.41 mm (0.410 in.)	(p. 2A-21, Ref. 5.16)
Cladding Outer Diameter	12.27 mm (0.483 in.)	(p. 2A-21, Ref. 5.16)
Cladding Thickness	0.8128 mm (0.032 in.)	(p. 2A-21, Ref. 5.16)
Number of Water Rods	2	(64 minus 62)
Water Rod Outer Diameter	12.45 mm (0.490 in.)	(p. 13, Ref. 5.29)
Water Rod Thickness	0.7112 mm (0.028 in.)	(p. 13, Ref. 5.29)
Channel Inside Width	134.06 mm (5.278 in.)	(p. 6-10, Ref. 5.28)
Channel Thickness	2.03 mm (0.080 in.)	(p. 6-10, Ref. 5.28)
Channel Corner Radius	9.65 mm (0.380 in.)	(p. 6-10, Ref. 5.28)
Active Fuel Length	3810.0 mm (150.0 in.)	(p. 2A-21, Ref. 5.16)
Uranium per Assembly	183 kg *	(p. 2A-21, Ref. 5.16)

* See Section 7.2 for assumed design basis initial uranium per assembly

The physical dimensions of the Savannah River pour canister, selected as the design basis for size in Section 7.4, are listed in Table 4.1-5. The dimensions are taken from Section 3 of Reference 5.16.

Table 4.1-5. Savannah River Pour Canister Dimensions

Outer Diameter	609.6 mm (24.0 in)	(p. 3.3-4, Ref. 5.16)
Outer Length	2997.2 mm (118.0 in.)	(p. 3.3-4, Ref. 5.16)
Canister Wall Thickness	9.525 mm (0.375 in.)	(p. 3.3-4, Ref. 5.16)
Canister Inside Volume	0.736 m^3	(p. 3.3-6, Ref. 5.16)
Canister Loading	85% of Volume	(p. 3.3-6, Ref. 5.16)
Glass Volume	0.6256 m^3	(85% of 0.736)
Glass Height	2.284 m (89.9 in.)	(See Assumption 4.3.16)
Glass Weight	1682 kg	(p. 3.3-6, Ref. 5.16)
Canister Weight	500 kg	(p. 3.3-6, Ref. 5.16)

4.2 Criteria

The design of individual WPs required for handling commercial SNF assemblies will depend on development of a reasonable design basis fuel which defines specifically what assemblies can be loaded into each WP design option. Criteria that relate to the development and design of repository components are derived from the applicable requirements and planning documents. Upper-level systems requirements are provided in the Mined Geologic Repository System Requirements Document (MGDSRD, Ref. 5.10). The requirements flow down to the Engineered Barrier Design Requirements Document (EBDRD, Ref. 5.8) as specific requirements for engineered barrier segment design and the Repository Design Requirements Document (RDRD, Ref. 5.7) as specific requirements for the repository segment. The Controlled Design Assumptions Document (CDA, Ref. 5.9) provides guidance for requirements listed in the EBDRD and RDRD which have unqualified or unconfirmed data associated with the requirement.

Based upon the applicable requirements, one criterion, applicable to this design analysis, was developed:

> Design basis and average thermal characteristics shall be defined for each waste package design to support the consideration of thermal effects and thermal loads. (TBV)
> [EBDRD 3.7.1.B]

The "TBD", "TBV", and "TBR" items identified in the applicable criteria documents will not be carried to the conclusions of this analysis based on the rationale that the conclusions derived by this analysis are for preliminary design and will not be used as input into documents supporting construction, fabrication, or procurement of specific waste package designs.

Finally, this design analysis is not intended to satisfy the referenced requirements in their entirety because this analysis is for the preliminary stage of WP design. The determination of full compliance with the EBDRD requirements will be performed in another design analysis when the WP designs are beyond the preliminary design phase.

4.3 Assumptions

Based on the rationale that the conclusions derived by this analysis are for preliminary design and will not be used as input into documents supporting construction, fabrication, or procurement, a TBD (to be determined) or TBV will not be carried to the conclusions of this analysis.

4.3.1 The maximum single assembly heat acceptable for the 12 PWR capacity waste packages (12 PWR high heat and 12 PWR South Texas) identified in Table 4.1-1 can be increased to 1500 watts. As discussed in the design configuration evaluation (p. 29, Ref. 5.11) the 12 PWR WP design can accommodate up to 1500 watts per assembly while still maintaining the ability to meet internal and near-field thermal goals. Therefore, this increased heat output capability will be assumed here as it will increase the number of high heat assemblies that can be captured by the system of WP designs specified in Table 4.1-1, particularly for the waste stream cases with the full 86,800 MTUs of SNF. Note that the impact on the design basis for shielding analysis is not discussed here. Shielding design bases that cover all of the commercial SNF to be delivered to the MGDS have not yet been specified. The specification of a more conservative design basis for shielding will not invalidate the design thermal compatibility with a 1500 W limit. This assumption is used in Section 4.1. (TBV)

4.3.2 It is assumed for this analysis that the waste package will not contain consolidated SNF rods, but will only contain intact SNF assemblies. This is consistent with CDA KEY 008 of Reference 5.9. This assumption is used throughout Section 7.2. (TBV)

4.3.3 The Babcock & Wilcox (B&W) 15x15 Mark B4 PWR SNF assembly (p. 2A-7, Ref. 5.16) will adequately represent typical PWR assemblies for the purpose of this analysis. Specific dimensions and characteristics of the assembly type are given in Table 4.1-2, and are typical for commercial PWR assemblies. Also, this assembly type is consistent with the criticality array configuration (B&W 15x15) assumed for the multi-purpose canister (MPC) procurement specification (p.27, Ref. 5.22). This assumption is based on engineering judgment and is used in Sections 4.1 and 7.2. (TBV)

4.3.4 Dimensions not listed for the Westinghouse 17x17 South Texas PWR SNF assembly (p. 2A-32, Ref. 5.16) are assumed to be represented by the standard (LOPAR) Westinghouse 17x17 assembly. The few dimensions that are listed for the South Texas assemblies in Reference 5.16 (p. 2A-32) are equivalent to those listed for the standard (LOPAR) Westinghouse 17x17 assembly (p. 2A-30, Ref. 5.16 and p. 2.1.2.2-3, Ref. 5.17); therefore, it is assumed that the South Texas design differs from the standard design only in length. This is consistent with the South Texas Project Safety Analysis Report (Ref. 5.32) and the listing of South Texas as a LOPAR design on page 2.1.2.1-2 of Reference 5.17. This assumption is based on engineering judgement and is used in Sections 4.1 and 7.2.

4.3.5 The General Electric (GE) GE-5 8x8 BWR SNF assembly (p. 2A-21, Ref. 5.16) will adequately represent typical BWR assemblies for the purpose of this analysis. Specific dimensions and characteristics of the assembly type are given in Table 4.1-4, and are typical for commercial BWR assemblies. Also, this assembly type is consistent with the criticality array configuration (GE 8x8) assumed for the MPC procurement specification (p.27, Ref. 5.22). This assumption is based on engineering judgment and is used in Sections 4.1 and 7.2. (TBV)

4.3.6 The SNF assembly masses for PWR, South Texas, and BWR assemblies are assumed bounded by 773.4 kg, 882.2 kg, and 328.4 kg, respectively. These maximum assembly weights for PWR, South Texas (long PWR), and BWR assemblies were developed in the design analysis Waste Container Cavity Size Determination (p. 27, Ref. 5.36), and are assumed to be bounding assembly weights for this analysis. These values include total design weight and variability. This assumption is based on engineering judgement. This assumption is used in Section 7.2. (TBV)

4.3.7 For the determination of homogeneous SNF assembly specific heat, it is assumed that the assembly is comprised of only uranium oxide (UO_2) and zircaloy. Besides the UO_2 the assembly is composed of the zircaloy tubes and spacer grids, end fittings, channels, etc. which may be zircaloy or may be stainless steel (Incaloy) which has a specific heat similar to (generally greater than) zircaloy. It is reasonable to assume that the specific heat difference between these alloy steels are small and that the WP fill gas does not significantly contribute to the total assembly specific heat. Therefore, the homogeneous specific heat is a simple mass weighted average as given by Equation 7.2-1. The basis of this assumption is engineering judgement. This assumption is used in Section 7.2.

4.3.8 For the determination of the design basis SNF heat production, the average enrichment for each burnup considered will be used. The basis for this assumption is that PWR and BWR reactors are designed to make use of the uranium-235 enriched fuel to the maximum extent that is economical. Therefore, in reactor operation, it is typically desirable to attain a particular burnup of an assembly consistent with its enrichment. Inspection of the waste stream projection provided in Reference 5.5 reveals that there is a strong correlation between SNF enrichment and burnup. Also, for the purpose of determining SNF thermal output, there is only a very small dependence on assembly enrichment (for a given burnup). An enrichment/burnup mismatch (such as for assemblies that were damaged and removed from service early) does not have the impact on thermal output that it has for criticality control. This assumption is used in Section 7.2.

4.3.9 The specific MGDS commercial SNF assembly receipt scenarios to consider are identified in Reference 5.5 and have been developed based upon the best information available. The specific SNF assembly receipt scenarios and the associated assembly data from Reference 5.5 are assumed to be representative of the range of waste receipt variability that the MGDS can

reasonable expect. This assumption is based upon engineering judgement. This assumption is used in Sections 4.1 and 7.3. (TBV)

4.3.10 The use of the fully moderated SNF assembly $k_{infinity}$ as an indicator of the level of criticality control required to maintain a commercial SNF assembly in a subcritical condition is assumed to bound the fully moderated $k_{effective}$ of a WP which is fully loaded with the same commercial SNF assembly. The use of $k_{infinity}$, rather than the $k_{effective}$, for a commercial SNF assembly is conservative due to the neutron leakage term which is not used for $k_{infinity}$. This assumption implies that the enrichment/burnup parameters for a commercial SNF assembly which determines the constant $k_{infinity}$ isopleths are assumed to be the same enrichment/burnup values which determine the $k_{effective}$ isopleth if a detailed WP calculation were performed. This assumption is based upon engineering judgement. This assumption is used in Sections 6.2 and 7.3. (TBV)

4.3.11 The use of the following equation obtained from page 5-4 of Reference 5.6 is assumed to provide representative, but slightly conservative values for PWR SNF assembly $k_{infinity}$ values.

$$k_{infinity} = 1.06 - (0.01 \cdot b) - (0.002 \cdot c) + (0.114 \cdot a) + (0.00007081 \cdot b^2) + (0.00007565 \cdot c^2) - (0.007 \cdot a^2) - (0.0002671 \cdot b \cdot a) - (0.0001145 \cdot b \cdot c) + (0.0002318 \cdot c \cdot a) + (0.000009366 \cdot b \cdot c \cdot a)$$

Where:
a = initial uranium-235 enrichment in weight percent
b = assembly burnup in GWd/MTU
c = assembly cooling time (i.e., age) in years

The usage and development of this equation for PWR SNF is presented in detail in Reference 5.6, and is used here with one minor modification: the regression is assumed applicable for PWR ages up to 40 years. All assemblies older than 40 years are assigned the age of 40 years. Reference 5.6 conservatively recommends a maximum age of 20 years, which was expanded to 40 years in Reference 5.11 with minimal consequences. This assumption is based upon engineering judgement and is used in Sections 6.2 and 7.3. (TBV)

4.3.12 The use of the following equation developed in Attachment II of Reference 5.11 is assumed to provide representative, but slightly conservative values for BWR SNF assembly $k_{infinity}$ values.

$$k_{infinity} = 0.92601 - (0.012598 \cdot b) + (0.19901 \cdot a) + (0.0000949922 \cdot b^2) - (0.006702 \cdot a^2) - (0.001243 \cdot b \cdot a)$$

Where:
a = initial uranium-235 enrichment in weight percent
b = assembly burnup in GWd/MTU

The data which form the basis for this equation were obtained from NRC approved BWR rack analysis documentation and provided in References 5.4, 5.14, and 5.15. The data in these references are documented as bounding $k_{infinity}$ values for BWR assembly designs of various initial enrichments, assembly exposures, and assembly configurations. The equation development is provided in Attachment II of Reference 5.11. The equation is shown (in Reference 5.11) to be somewhat conservative for burnups generally less than 5 GWd/MTU, due to the neglected Gadolinium burnup, and should be used with caution for assemblies with very low burnup. This assumption is based upon engineering judgement and is used in Sections 6.2 and 7.3. (TBV)

4.3.13 All commercial SNF is assumed to fit into the basic WP SNF basket envelope developed in Reference 5.6. There are two notable exceptions which must be accommodated in this analysis:

1) South Texas PWR SNF assemblies are designed for a 14 foot reactor core (see Table 4.1-3) rather than the standard 12 foot reactor core. The South Texas PWR assemblies fit the standard PWR cross section but will require a longer WP length.

2) Big Rock Point BWR SNF assemblies are designed with an assembly square cross section of 6.52 inches (p. 123, Ref. 5.33) rather than the standard 5.44 inch square cross section. The Big Rock Point assemblies are also approximately half the length of the standard BWR assembly design.

Clearly, the South Texas PWR SNF will require a new WP design since these assemblies require a longer WP basket envelope and there are not enough of these long assemblies to justify the cost of fabricating all WPs with the additional length. Thus, specific accommodation of a South Texas SNF WP will be included in this analysis in order to capture the additional cost of this WP type. However, additional options to handle the Big Rock Point BWR SNF are available; such as (but not limited to) putting these assemblies into a standard PWR WP. Finally, there is a very small number of Big Rock Point BWR assemblies; therefore, assuming that they are handled as part of the standard BWR SNF waste stream will not significantly affect the results of this analysis. This assumption is based upon engineering judgement and experience of the LDE and the originating engineer for this design analysis. This assumption is used in Section 7.3. (TBV)

4.3.14 It is assumed that the few SNF assemblies not placed into any WP design type (unbinned) by the WPBIN00D program will not impact the average characteristics calculated for that WP type. As indicated in Section 7.3.3, there are some SNF assemblies that did not meet the loading requirements for any of the specified WP types. However, these assemblies represent a very small portion (approximately 0.04% for "Case 1") of the total waste stream and are judged to have little or no impact on averages such as the decay heat tables. This assumption is based upon engineering judgement and is used in Section 7.3.

4.3.15 The Savannah River pour canister is assumed to be adequately represented as presented in Section 3 of Reference 5.6 and is assumed to be the representative design which specifies the geometry and materials of construction. The Savannah River pour canister design is assumed as a basis (in size and weight) for the design of the defense high-level waste (DHLW) waste package. The basis of this assumption is that the specified reference is the best information available concerning the pour canister designs. This assumption is used in Section 7.4. (TBV)

4.3.16 It is assumed that the pour canister is filled to a height of 2.284 meters. Basis: this fill height is calculated based on the canister volume of 0.736 m^3 (Table 4.1-5), the volume percentage glass loading of 85% (Table 4.1-5), and the nominal inner diameter of the pour canister of 590.55 mm (from outer diameter and thickness of Table 4.1-5). Assuming the canister is a right circular cylinder, the fill height would be $[4 \times \text{Volume} \times \text{Fill\%}] \div [\pi \times \text{Diameter}^2]$. The rest of the canister internal volume is assumed void space such that all of the canister heat is conservatively produced in the glass portion of the canister (see Assumption 4.3.17). This assumption is used in Sections 4.1 and 7.4.

4.3.17 It is assumed for this analysis that, for the HLW canister heat generation rates discussed in Assumption 4.3.22, all of the decay heat from the radioactive material is captured in the glass matrix. This includes all gamma radiation, neutrons, alpha particles, etc. Since the references do not state if any of the heat escapes the glass matrix, it is conservative to assume that all of the heat generation quoted in the references is captured in the glass matrix. This assumption is based upon engineering judgement. This assumption is used in Section 7.4.

4.3.18 It is assumed for this analysis that an axial power peaking factor of 1.00 for the HLW canister is reasonable and sufficient to obtain the peak glass matrix temperatures. Use of this factor assumes that the glass manufacturing process is controlled such that a reasonably homogeneous glass matrix is obtained and that any axial variations are negligible. This assumption is based upon engineering judgement. This assumption is used in Section 7.4.

4.3.19 The density of the borosilicate glass is assumed adequately represented by the quotient of nominal glass mass and volume. From Table 4.1-5, the mass of the glass in the Savannah River pour canister is 1682 kg and the glass volume is 0.6256 m^3. The calculated nominal glass density would then be 2688.6 kg/m^3. This estimate of glass density is based on engineering judgement. This assumption is used in Section 7.4.

4.3.20 Use of the conductivity for borosilicate glass in Reference 5.25 is assumed to adequately represent the glass waste form. The value for thermal conductivity of 1.1 W/m·K is the mid-range value for borosilicate glass reported in Table 11.7 (p. 584) of Reference 5.25 for a temperature range of 100°C to 500°C. This is slightly less than (resulting in higher glass temperatures than) the value of 1.4 W/m·K for Pyrex glass (Table A.3, p. 679, Ref. 5.24). This assumption is used in Section 7.4.

4.3.21 Use of the specific heat and emissivity for Pyrex glass is assumed to adequately represent the borosilicate glass waste form. The specific heat of Pyrex glass at 300 K is 835 J/kg·K (Table A.3, p. 679, Ref. 5.24) and the emissivity is 0.81 (calculated as the average of 0.82 at 300 K and 0.80 at 600 K, Table A.8, p. 692, Ref. 5.24). The use of Pyrex glass is assumed reasonable since Pyrex contains boron, and the composition of the glass is reasonably close to the composition of borosilicate glass provided in Reference 5.17. This assumption is used in Section 7.4. (TBV)

4.3.22 The data from References 5.16 and 5.17 are assumed to accurately represent the HLW glass waste forms which may be received by the MGDS. Use of the data from References 5.16 and 5.17 in this manner is consistent with the reasons for its creation. Section 3 of Reference 5.16 (i.e., Tables 3.2.5, 3.3.5, 3.4.7, and 3.5.4) and Section 2.2.1.3 of Reference 5.17 (i.e., Table 6.9, 6.10, 6.11, and 6.12) provide information concerning the decay heat versus time for the glass waste forms anticipated to be manufactured at Hanford, the Savannah River Plant (SRP), West Valley (WV), and the Idaho National Environmental and Engineering Laboratory (INEEL). It is further assumed that the curve fit representation of the data performed in Reference 5.31 is a reasonable representation of the data presented in References 5.16 and 5.17 and that the use of the curve fit representation will not affect future analysis results. The basis for this assumption is engineering judgement using the curve fit deviation evaluation presented in Attachments I, IV, and VII of Reference 5.31. This assumption is used in Section 7.4. (TBV)

4.3.23 It is assumed that the decay heat for the West Valley glass waste is representative of the decay heat for the INEEL glass waste. The INEEL data were judged to be very similar and less limiting than that presented for West Valley, and a curve fit of the INEEL data for use in future ANSYS analyses was not performed in Reference 5.31. This assumption is used in Section 7.4. (TBV)

4.3.24 It is assumed for this analysis that all of the HLW glass waste form is emplaced in the repository with an insignificant aging time (i.e., the glass pour canisters are emplaced in the repository immediately after manufacture). The basis of this assumption is that there are no repository waste acceptance criteria that indicates a minimum aging time after vitrification, so canister aging cannot be depended upon. This assumption is conservative since it does not allow the radioactive material to significantly decay before emplacement which increases the amount of heat generated in the glass matrix. Therefore, use of this assumption will slightly over-predict the glass matrix temperatures. This assumption is used in Section 7.4. (TBV)

4.4 Codes and Standards

Not applicable.

5. References

5.1 Yucca Mountain Site Characterization Project Q-List, YMP/90-55Q, REV 4, U.S. Department of Energy (DOE) Office of Civilian Radioactive Waste Management (OCRWM).

5.2 QAP-2-0 Activity Evaluation (WP-24): "Perform Waste Stream Analysis to Determine Design Basis Fuel," Civilian Radioactive Waste Management System (CRWMS) Management and Operating Contractor (M&O), August 3, 1997.

5.3 Quality Assurance Requirements and Description, DOE/RW-0333P REV 7, U.S. DOE OCRWM.

5.4 Pilgrim Nuclear Power Plant Spent Fuel Pool Rack Design, HOLTEC Document Number: HI-92925, U.S. Nuclear Regulatory Commission (NRC) Docket Number: 50-293, U.S. NRC, Washington, D.C.

5.5 "Input Files and Models Used in the Waste Quantity, Mix and Throughput Study", M. Fleming, Interoffice Correspondence VA.SAI.MF.03/97.007, CRWMS M&O, March 21, 1997.

5.6 Mined Geologic Disposal System Advanced Conceptual Design Report, Volume III of IV, Engineered Barrier Segment/Waste Package, DI Number: B00000000-1717-5705-00027 REV 00, CRWMS M&O.

5.7 Repository Design Requirements Document, YMP/CM-0023, REV 0, ICN 1, U.S. DOE Yucca Mountain Site Characterization Project.

5.8 Engineered Barrier Design Requirements Document, YMP/CM-0024, REV 0, ICN 1, U.S. DOE Yucca Mountain Site Characterization Project.

5.9 Controlled Design Assumptions Document, DI Number: B00000000-01717-4600-00032, REV 04, ICN 02, CRWMS M&O.

5.10 Mined Geologic Disposal System Requirements Document, DOE/RW-0404P, DI Number: B00000000-00811-1708-00002 REV 02, DCN 02, U.S. DOE OCRWM.

5.11 Determination of Waste Package Design Configurations, DI Number: BBAA00000-01717-0200-00017 REV 00, CRWMS M&O.

5.12 Software Qualification Report for the Spent Nuclear Fuel Decay Heat Function (SNFDHF), DI Number: 20026-2003 REV 00, CRWMS M&O.

5.13 Software Life Cycle Plan for the Spent Nuclear Fuel Decay Heat Function (SNFDHF), DI Number: 20026-2001 REV 00, CRWMS M&O.

5.14 Proposed Modification to the Technical Specifications for the Pilgrim Spent Fuel Pool Rack Design, HOLTEC Document Number: HI-93126, U.S. NRC Docket Number: 93-016, U.S. NRC, Washington, D.C.

5.15 Duane Arnold Nuclear Power Plant Spent Fuel Pool Rack Design, HOLTEC Document Number: HI-92987, U.S. NRC Docket Number: 50-331, U.S. NRC, Washington, D.C.

5.16 Characteristics of Potential Repository Wastes, DOE/RW-0184-R1; Volume 1, U.S. DOE OCRWM, July 1992.

5.17 Waste Form Characteristics Report, Version 1.2, UCRL-ID-108314 REV 1.2, Lawrence Livermore National Laboratory (LLNL), December 1996.

5.18 Design Basis Fuel, DI Number: BBA000000-01717-0200-00121 REV 00, CRWMS M&O.

5.19 Waste Package Design Basis Fuel Analysis, Draft Document, DI Number: B00000000-01717-0200-00127 REV 00A (RPC-951204-01), CRWMS M&O, September 19, 1995.

5.20 Waste Quantity, Mix and Throughput Study Report, DI Number: B00000000-01717-5705-00059 REV 01, CRWMS M&O.

5.21 Spent Nuclear Fuel Effective Thermal Conductivity Report, DI Number: BBA000000-01717-5705-00010 REV 00, CRWMS M&O.

5.22 Multi-Purpose Canister (MPC) Subsystem Design Procurement Specification, DI Number: DBG000000-01717-6300-00001 REV 06, CRWMS M&O.

5.23 Nuclear Systems I Thermal Hydraulic Fundamentals, Neil E. Todreas and Mujid S. Kazimi, Hemisphere Publishing Corporation, New York, NY, 1990.

5.24 Introduction to Heat Transfer, F. P. Incropera and D. P. DeWitt, John Wiley & Sons Inc., 1985.

5.25 Nuclear Chemical Engineering, M. Benedict, T. H. Pigford, and H. W. Levi, McGraw-Hill Book Company, New York, NY, 1981.

5.26 Thermal Evaluation of the Conceptual 12 PWR MPC with ACD Disposal Container, DI Number: BBABA0000-01717-0200-00002 REV 00, CRWMS M&O.

5.27 Multi-Purpose Canister Issue Evaluation, Issue No. MPC-009, Attachment 2 of M&O Correspondence LV.WP.RHB.7/93-133, CRWMS M&O, July 14, 1993.

5.28 Station Nuclear Engineering Manual, GE Mechanical & Nuclear Engineering Training, General Electric Co., NEDO-24810 / 80NED032, September 1980.

5.29 Determination of 8x8 Rod Array BWR SNF Assembly Effective Thermal Conductivity, DI Number: BBA000000-01717-0200-00017 REV 00, CRWMS M&O.

5.30 Engineered Barrier System Performance Requirements Systems Study Report, DI Number: BB0000000-01717-5705-00001 REV 02, CRWMS M&O.

5.31 Thermal Evaluation of the Conceptual DHLW Disposal Container, DI Number: BBAC00000-01717-0200-00002 REV 00, CRWMS M&O.

5.32 South Texas Project Units 1 and 2, Updated Final Safety Analysis Report, Revision 5, Houston Lighting and Power Document Number: ST-HL-AE-5523, U.S. Nuclear Regulatory Commission Docket Numbers: STN 50-498 and STN 50-499, Houston Lighting and Power, Wadsworth Texas, December 18, 1996.

5.33 Spent Nuclear Fuel Discharges from U.S. Reactors 1994, SR/CNEAF/96-01, Energy Information Administration, U.S. DOE, Washington D.C., February 1996.

5.34 Standard Review Plan for Dry Cask Storage Systems, Final Report, NUREG-1536, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, U.S. NRC, Washington D.C., January 1997.

5.35 Waste Package Design (Basis for Site Characterization Plan, Chapter 8), YMP/CM-0010 Rev. 00, U.S. DOE Yucca Mountain Site Characterization Project.

5.36 Waste Container Cavity Size Determination, DI Number: BBAA00000-01717-0200-00026 REV 00, CRWMS M&O.

5.37 The TN-24P PWR Spent-Fuel Storage Cask: Testing and Analysis, EPRI NP-5128, PNL-6045, Pacific Northwest Laboratory/Virginia Power Company/EG&G, Idaho National Engineering Laboratory, April 1987.

5.38 Repository Thermal Loading Management Analysis, DI Number: B00000000-01717-0200-00135 REV 00, CRWMS M&O.

6. Use of Computer Software

6.1 Scientific and Engineering Software

The GETHEAT function and its HEAT.DAT data file provided in the Spent Nuclear Fuel Decay Heat Function (SNFDHF) code system (Ref. 5.12) version (V) 1.0 (CSCI: 20026 V1.0) are used in this analysis. The GETHEAT function, with its HEAT.DAT data file (provided here as Attachment III), is designed to calculate PWR and BWR SNF decay heat rates given the assembly burnup, decay time (i.e., age), and assembly average initial uranium-235 enrichment. Thus, the GETHEAT function is appropriate for use with the PHIA00D and WPBIN00D programs provided in Attachments I and II to determine SNF decay heat loads as a function of time. The GETHEAT function is executed on an IBM compatible PC. The software qualification of the GETHEAT function, including problems of the type analyzed in this report, is summarized in the Software Qualification Report for the SNFDHF code system (Ref. 5.12). The GETHEAT evaluations performed for this design analysis are fully within the range of the validation for the GETHEAT software. Access to and use of the GETHEAT software function for this analysis was granted by Software Configuration Management and performed in accordance with the Life Cycle Plan for the SNFDHF code system (Ref. 5.13) and the QAP-SI series procedures. Inputs and outputs to the GETHEAT software function are included as attachments as described in this design analysis.

6.2 Computational Support Software

The design basis SNF heat load files were generated with the computer code PHIA00D (PHIA Version 00D) which is classified as computational support software. PHIA00D is not a controlled computer code and has not been qualified under the QAP-SI series of M&O procedures. Based upon the inputs provided in Section 7.2 and Assumption 4.3.8, PHIA00D uses the GETHEAT function (see Section 6.1) to perform a table look up using the data set of Attachment III. Once the proper sub-set of data is obtained, PHIA00D then will interpolate data points in order to generate an ANSYS usable data file. (ANSYS is an engineering analysis software program in use by the Waste Package Development Department.) The PHIA00D code listing and input database file (used by GETHEAT) are provided here as Attachments I and III. The ANSYS-readable output data files are provided in the attachments described in Section 7.2. The PHIA00D code is simply an automation of a simple data manipulation which can easily be checked by hand. The data are provided in this analysis for the purpose of performing hand calculation checks. The data manipulation has been checked by hand and will be used in this analysis on that basis. The PHIA00D code has been utilized as computational support software as it was intended and is appropriate for the use of generating ANSYS-readable SNF heat load files. The PHIA00D software was executed on an IBM compatible PC.

The percent values of the commercial SNF waste stream handled, the number of WPs of each type required, the decay heat of each WP type, and the number of SNF assemblies not handled by a proposed WP system scenario were generated with the computer code WPBIN00D (WPBIN Version 00D) which is classified as computational support software. WPBIN00D is not a controlled computer code and has not been qualified under the QAP-SI series of M&O procedures. Based upon the inputs provided in Section 7.3 and Assumptions 4.3.9 through 4.3.13, WPBIN00D determines commercial SNF assembly heat output and criticality potential using the GETHEAT function (see Section 6.1) and the equation from either Assumption 4.3.11 (for PWR SNF) or 4.3.12 (for BWR SNF), and then determines which WP type (from Table 4.1-1) the SNF assembly can be loaded into, and finally tallies that assembly to the selected WP type. If the SNF assembly does not meet any of the WP type criteria, then the assembly is tallied into a non-standard SNF bin ("unbinned" assemblies). Once each assembly in the waste stream has been tallied, WPBIN00D then summarizes the number of each WP type required and prints both a final summary table and a separate file containing the average assembly decay heat for each WP type in an ANSYS-readable format.

The WPBIN00D code listing is provided in Attachment II, and the output files with an input listing are provided in the attachments described in Section 7.3. The WPBIN00D code is simply an automation of a simple data manipulation process which can easily be checked by hand. The data are provided in this analysis and the references for the purpose of performing hand calculation checks. The data manipulation has been checked by hand, and will be used in this analysis on that basis. The WPBIN00D code was utilized for the purpose of computational support software as it was intended. The WPBIN00D software was executed on an IBM compatible PC.

The presentation graphics provided in Section 7 were generated with the computer code Harvard Graphics Version 2.0 which is classified as computational support software. Harvard Graphics Version 2.0 was executed on a IBM compatible PC. Harvard Graphics Version 2.0 is not a controlled computer code and has not been qualified under the QAP-SI series of M&O procedures and will not be qualified under the M&O procedures. Harvard Graphics Version 2.0 simply provides a framework to create a graphical representation of data. No calculation or modification beyond cut and paste operations with tabular data was performed in Harvard Graphics.

7. Design Analysis

7.1 Introduction

As part of an engineered barrier system for the containment of radionuclides, the waste package (WP), which can include a canistered waste form, must be shown to comply with all regulations and requirements that govern the conditions of the emplaced spent nuclear fuel (SNF) and the near-field rock at the repository horizon. Temperatures in the WP and near-field host rock are key to radionuclide containment, as they directly affect corrosion rates of the metal barriers and the ability of the rock to impede particle movement. Postclosure release rates are regulated by 10 CFR 60, 10 CFR 960, and 40 CFR 191. Maximum allowable temperatures, based on material performance criteria, have been specified as design goals for the WP/Engineered Barrier design (see the requirements documents cited in Section 4.2).

The method for WP thermal evaluations involves a three-step approach to determine the time-dependent WP thermal behavior. A three-dimensional (3-D) transient finite element model of the WP emplacement provides the WP surface temperature history for use as a boundary condition in a detailed WP model. Resulting SNF basket wall temperature predictions from the WP model provide the boundary for an estimation of peak SNF cladding temperatures. Cladding temperatures are predicted in the WP model using an effective conductivity defined to represent an homogeneous SNF assembly. Cladding temperatures may also be conservatively estimated using an empirical correlation.

This design analysis describes the development of spent nuclear fuel decay heat outputs for use in subsequent thermal analyses. To adequately describe the performance of the waste package, the waste form, and the repository near field; representative spent fuel decay heat outputs are needed for each waste package design type. Also, to demonstrate compliance with maximum temperature limitations, design basis heat outputs must also be specified to bound the hottest SNF assemblies that may be placed within a particular waste package design type. Reasonable repository performance is supported both by demonstrating that peak temperatures remain below maximum limits for the most stressing (highest heat output) loaded assemblies and by demonstrating knowledge of the average (or nominal) repository thermal response.

7.2 Determination of Design Basis SNF

It is likely that the license application for the waste package will be reviewed by the Nuclear Regulatory Commission using criteria similar to those already in place for dry cask storage systems. That is not to say the requirements placed upon the disposal device are the same as for storage casks, but that the topical safety analysis report (SAR) for the waste package should follow the standard format and content established for dry cask storage SARs. The *Standard Review Plan for Dry Cask Storage Systems* (p. 1-4, Ref. 5.34) states that:

> "The application should present a general description of the fuel or other contents for storage in DCSS. ... Key parameters for spent fuel include the type of fuel (i.e., PWR, BWR, or both), number of fuel assemblies, and condition of the fuel assemblies (intact or consolidated). This section often includes additional characteristics, such as maximum burnup, initial enrichment, heat load, and cooling time, as well as the assembly vendor and configuration (e.g., Westinghouse 17x17), and these characteristics may also be repeated in the principal design criteria. In addition, the cover gas, if any, should be identified."

Due to the large variability in SNF characteristics, several separate WP designs (as specified by Reference 5.11) will be required to accommodate all of the SNF earmarked for disposal in the first repository (as intact assemblies, see Assumption 4.3.2). Each individual WP design must have a specifically designated design basis fuel, and each WP type must be designed and evaluated to accommodate the bounding or limiting case SNF assembly which may have a thermal output much higher than average. Thus, a design basis SNF assembly can be determined which can be considered the hottest assembly that could be loaded and emplaced in that particular waste package. The detailed waste package/engineered barrier evaluation with design basis SNF would then represent the hottest waste package in a repository at a given thermal loading (with otherwise average SNF). While all of the waste packages (hot and cold) will collectively influence repository temperatures (average SNF characteristics), every waste package must meet thermal goals (design basis SNF characteristics).

Given that higher capacity waste packages are more likely to exceed thermal goals than smaller ones in the same repository thermal environment, the choice of a design basis SNF is important because it could limit the number of assemblies that can be loaded in one WP without exceeding thermal goals for disposal. The limiting SNF thermal goal for large waste packages is a temperature of no more than 350°C at the SNF cladding (DCWP 001, p. 8-3, Ref. 5.9). Several different design basis SNF types have been previously used by the OCRWM to demonstrate compliance with requirements and to allow comparison with previous evaluations. Table 7.2-1 summarizes the SNF types used. The heat loads for each assembly type have been calculated previously (Table 7.2-1, p. 38, Ref. 5.26) and are included here only for comparison.

Table 7.2-1. Previous Thermal Analysis SNF Assembly Design Bases

Organization	SNF Type	SNF Age	SNF Burnup	Enrichment	Uranium Mass	Initial Heat
MGDS (p. 32, Ref. 5.19)	PWR	10 years	48 GWd/MTU	4.20%	0.464 kg	850 watts
MGDS (p. 34, Ref. 5.19)	BWR	10 years	49 GWd/MTU	3.74%	0.200 kg	409 watts
MPC (p. 27, Ref. 5.22)	PWR	20 years	40 GWd/MTU	3.75%	0.490 kg	547 watts
MPC (p. 27, Ref. 5.22)	BWR	20 years	40 GWd/MTU	3.75%	0.200 kg	265 watts
MPC Historic (p. 2, Ref. 5.27)	PWR	10 years	40 GWd/MTU	3.75%	0.490 kg	718 watts

7.2.1 Design Basis SNF Assembly Type and Mass

Much of the previous design basis fuel and design basis repository waste stream analyses have considered the metric tons of uranium (MTUs) to be delivered and the estimated heat per MTU emplaced. For this analysis, an additional step is taken to base the determination on the performance parameters (ie., heat) expected for actual assemblies, rather than per MTU. This will capture the effects of variations in MTU/assembly, which are important since the waste packages are designed to hold a specific number of assemblies, not a specific MTU.

7.2.1.1 PWR SNF

An assumed assembly mass is required in order to determine the decay heat curve of the thermal design basis SNF. To begin the characterization of the PWR SNF, the physical size and uranium mass content of each PWR assembly in Reference 5.16 were compared. Of the PWR assembly types with an initial uranium mass listed, the B&W Mark B4 PWR assembly (p. 2A-7, Ref. 5.16) had the highest mass of 464 kg of uranium per assembly (see Table 4.1-2). This assembly type and mass has been previously specified as a design basis assembly in earlier evaluations (p. 5-6, Ref. 5.6).

Reference 5.16, however, does not include projections of future SNF assemblies or discharges, which is the subject of a recent waste quantity throughput study (Ref. 5.20). The throughput study used as input twelve potential commercial SNF waste stream projections (Ref. 5.5) of which "Case 1" was selected as a recommended repository design reference (Section 5.6.1, Ref. 5.20). Inspection of the data file for "Case 1" (attachment to Ref. 5.5) yields the uranium mass for each discharged batch. Table 7.2-2 presents the initial assembly uranium mass range (rounded to the nearest kg) for each reactor (or location that will be shipping SNF to the first repository) for PWR SNF from "Case 1". A PWR assembly (such as the B&W Mark B4) with an initial uranium mass of 464 kg (somewhat greater than nominal) could reasonably represent an assembly from any of these reactors, excluding South Texas. Further, there are relatively few PWR assemblies (with respect to the entire inventory) with masses greater than 0.464 MTU. Therefore there is no reason, at this time, to select a different assembly type and the assembly described in Table 4.1-2 will remain the assumed PWR design basis SNF assembly (see Assumption 4.3.3).

Table 7.2-2. PWR Uranium Mass per Assembly

SNF Source	Vendor	Minimum Assembly Uranium Mass (kg)	Maximum Assembly Uranium Mass (kg)
ARKANSAS NUCLEAR	CE, B&W	397	467
BEAVER VALLEY	WE	422	466
BRAIDWOOD	WE	423	430

BYRON	WE	423	427
CALLAWAY	WE	423	464
CALVERT CLIFFS	CE	359	399
CATAWBA	WE	421	457
COMANCHE PEAK	WE	407	463
COOK	WE	401	463
CRYSTAL RIVER	B&W	462	471
DAVIS-BESSE	B&W	468	475
DIABLO CANYON	WE	424	469
FARLEY	WE	424	467
FORT CALHOUN	CE	340	376
GINNA	WE	329	398
HADDAM NECK	WE	363	421
HANFORD	CE, WE	389	401
HARRIS	WE	423	465
INDIAN POINT	B&W, WE	175	464
INEEL	WE	389	460
KEWAUNEE	WE	358	405
MAINE YANKEE	CE	352	397
MCGUIRE	WE	421	466
MILLSTONE	CE, WE	361	465
NORTH ANNA	WE	455	467
OCONEE	B&W	429	587
PALISADES	CE	386	416
PALO VERDE	CE	398	441
POINT BEACH	WE	354	406
PRAIRIE ISLAND	WE	336	406
RANCHO SECO	B&W	461	470
ROBINSON	WE	200	461

SALEM	WE	419	468
SAN ONOFRE	CE, WE	311	429
SEABROOK	WE	463	463
SEQUOYAH	WE	458	467
SOUTH TEXAS	WE	538	544
ST. LUCIE	CE	345	400
SUMMER	WE	415	465
SURRY	WE	437	464
THREE MILE ISLAND	B&W	461	467
TROJAN	WE	448	467
TURKEY POINT	WE	442	464
VOGTLE	WE	423	466
WATERFORD	CE	395	431
WATTS BAR	WE	374	500
WEST VALLEY	WE	382	382
WOLF CREEK	WE	455	468
YANKEE-ROWE	WE	218	274
ZION	WE	437	464

To reduce thermal analysis model size, it is sometimes necessary to represent the SNF assembly as a smeared heat source. A description of this methodology is described in detail in the Spent Nuclear Fuel Effective Thermal Conductivity Report (Ref. 5.21). While the thermal conductivity of a PWR assembly modeled as a smeared heat source is provided with guidelines in Reference 5.21 for several fill gases, the specific heat and density of the design basis assembly may also be needed for some transient problems. The density may be represented simply by the total weight of an assembly divided by the volume of the smeared heat source area. The mass of the design basis PWR assembly is 773.4 kg (see Assumption 4.3.6), and the volume is the cavity opening of the SNF basket, which depends on the particular design being evaluated. The specific heat of the design basis PWR smeared heat source assembly is 274 J/kg·K as given by the mass weighted average of Equation 7.2-1 (assuming that the assembly is comprised only of uranium oxide and zircaloy, see Assumption 4.3.7).

$$C_p^{SNF} = (C_p^{UO_2} - C_p^{Zirc}) \times \frac{M^U}{M^{Assy}} \times \frac{AW_U + 2 \times AW_O}{AW_U} + C_p^{Zirc}$$

(Equation 7.2-1)

Where:
C_p^{UO2} = specific heat of uranium oxide, 247 J/kg·K at 100°C (Table 8-1, p. 296, Ref. 5.23)
C_p^{Zirc} = specific heat of zircaloy, 330 J/kg·K at 400°C (Table 8-2, p. 296, Ref. 5.23)
M^U = mass of uranium in the assembly, 464 kg (Table 4.1-2)
M^{Assy} = mass of entire assembly, 773.4 kg (see Assumption 4.3.6)
AW_U = atomic weight of uranium, 238.03
AW_O = atomic weight of oxygen, 15.9994

It is also sometimes necessary to reduce thermal analysis model size by representing the SNF assembly as a two-dimensional cross section at the hottest point. For a cross-sectional model of the waste package, an axial power peaking factor of 1.25 should be applied to the PWR SNF heat generation rate. This factor is based upon the experience of the analyst and will bound the range of axial power peaking factors for PWR SNF for the purpose of this DBF analysis. A general basis for this factor is that PWR reactor cores are designed such that axial peaking larger than an average of 1.25 is typically undesirable for the full duration of a reactor operating cycle for both licensing and economic reasons. Figure 3-18 of the TN-24P testing report (p. 3-29, Ref. 5.37) provides a typical power profile supporting this recommendation.

7.2.1.2 South Texas SNF

The PWR design basis assembly type represents all of the PWR assemblies except those from the South Texas reactor which are significantly longer (see Assumption 4.3.13). Therefore a separate design basis assembly is defined here for the waste package with South Texas assemblies. The South Texas assembly design type is indicated on page 2A-32 of Reference 5.16, and its dimensions are listed here in Table 4.1-3 (see Assumption 4.3.4). Reference 5.16 (p. 2A-32) does not indicate a uranium mass loading for South Texas assemblies; however, the waste stream projection information of Table 7.2-2 indicates a maximum uranium mass loading 544 kg per South Texas assembly, which provides a bounding assumption for the design basis South Texas assembly. It is reasonable to assume that the effective thermal conductivity for a South Texas assembly, which is a 17x17 array, would be bounded by the PWR effective thermal conductivity provided in Reference 5.21. The smeared heat source assembly would have a density calculated similar to that for other PWR assemblies but using a total assembly mass of 882.2 kg (see Assumption 4.3.6). Using Equation 7.2-1, the specific heat is 272 J/kg·K, assuming a uranium mass (M^U) of 544 kg and a total assembly mass (M^{Assy}) of 882.2 kg. An axial power peaking factor of 1.25 (the same as for other PWR assemblies) is also applicable to South Texas assemblies.

7.2.1.3 BWR SNF

To characterize the BWR SNF, the uranium mass content of different BWR assembly types were compared in the same manner as for PWR assemblies. Descriptions of BWR assembly types are provided in References 5.16 and 5.17, and projections of BWR discharges are provided in the waste quantity throughput study (Ref. 5.20). The throughput study used as input twelve potential commercial SNF waste stream projections (Ref. 5.5) of which "Case 1" was selected as a recommended repository design reference (Section 5.6.1, Ref. 5.20). Inspection of the data file for "Case 1" (attachment to Ref. 5.5) yields the uranium mass for each discharged batch. Table 7.2-3 presents the initial assembly uranium mass range (rounded to the nearest kg) for each reactor (or location that will be shipping SNF to the first repository) for BWR SNF from "Case 1". All of the discharged BWR assemblies are bounded by an initial uranium mass loading of 200 kg, which was the design basis value assumed in the Conceptual Multi-Purpose Canister specification (p. 27, Ref. 5.22), and will be specified here as the design basis for WP thermal analysis. The General Electric (GE) version 5 BWR assembly with an 8x8 rod array is a good representation of the BWR assembly types and is recommended as a design basis configuration here (see Assumption 4.3.5). The physical dimensions of this assembly are provided in Table 4.1-4.

Table 7.2-3. BWR Uranium Mass per Assembly

SNF Source	Vendor	Minimum Assembly Uranium Mass (kg)	Maximum Assembly Uranium Mass (kg)
BIG ROCK POINT	GE	123	139
BROWNS FERRY	GE	171	196
BRUNSWICK	GE	157	189
CLINTON	GE	178	186
COOPER STATION	GE	170	196
DRESDEN	GE	95	197
DUANE ARNOLD	GE	154	188
ENRICO FERMI	GE	170	184
FITZPATRICK	GE	142	196
GE MORRIS	GE	180	197
GRAND GULF	GE	176	184
HANFORD	GE	191	191
HATCH	GE	161	189

HOPE CREEK	GE	177	186
HUMBOLDT BAY	GE	69	77
INEEL	GE	59	196
LACROSSE	AC	108	121
LASALLE COUNTY	GE	177	186
LIMERICK	GE	169	187
MILLSTONE	GE	166	197
MONTICELLO	GE	165	194
NINE MILE POINT	GE	169	196
OYSTER CREEK	GE	172	196
PEACH BOTTOM	GE	170	196
PERRY	GE	175	185
PILGRIM	GE	172	197
QUAD CITIES	GE	170	196
RIVER BEND	GE	175	186
SUSQUEHANNA	GE	172	185
VERMONT YANKEE	GE	104	196
WASH. NUCLEAR	GE	168	184
WEST VALLEY	GE	112	141

As described for PWR assemblies, it is sometimes necessary to represent the SNF assembly as a smeared heat source. A description of this methodology is described in detail in the Spent Nuclear Fuel Effective Thermal Conductivity Report (Ref. 5.21). While the thermal conductivity of a BWR assembly modeled as a smeared heat source is provided with guidelines in Reference 5.21 for several fill gases, the specific heat and density of the design basis assembly may also be needed for some transient problems. The density may be represented simply by the total weight of an assembly divided by the volume of the smeared heat source area. The mass of the design basis BWR assembly is 328.4 kg (see Assumption 4.3.6), and the volume is the cavity opening of the SNF basket, which depends on the particular design being evaluated. The specific heat of the design basis BWR smeared heat source assembly is 273 J/kg·K as given by the mass weighted average of Equation 7.2-1 (assuming that the assembly is comprised only of uranium oxide and zircaloy, see Assumption 4.3.7), the uranium mass per assembly of 200 kg, and the total assembly mass of 328.4 kg.

For a cross-sectional model of the waste package, an axial power peaking factor of 1.40 should be applied to the BWR SNF heat generation rate. This factor is based upon the data in Appendix E of Reference 5.28 and will bound the range of axial power peaking factors for BWR SNF for the purpose of this analysis. A general basis for this factor is that BWR reactor cores are designed such that axial peaking larger than an average of 1.40 is typically undesirable for the full duration of a reactor operating cycle for both licensing and economic reasons.

7.2.2 Selection of Design Basis SNF Assembly Heat Output

Design basis SNF will impact the timing of peak near-field temperatures as well as the magnitude of the peak. The repository host rock temperatures beyond the near-field will peak between 10 to 500 years depending on the thermal loading but will be largely independent of the individual waste package design. The waste package itself will experience its peak temperature before the rock temperature peaks. The WP peak temperature and its timing will depend on the heat output of the design basis SNF and the basket/container design. Therefore, the choice of the design basis SNF is of key importance. Younger SNF types produce high peak temperatures within the first year which then drop off quickly. Older SNF (at the same initial power density, but not mass density) produces lower and later peaks with sustained higher long-term temperatures.

Each WP design option listed in Table 4.1-1 has a maximum initial assembly heat production associated with it. However, the assembly heat production as a function of time is also needed to address the transient effects of repository thermal loading. There are several combinations of assembly characteristics (age, burnup, enrichment, uranium mass) which could provide a given initial heat production. To select the recommended design basis heat production table for each WP design option, several combinations of assembly characteristics were evaluated (using PHIA00D) and compared, and the most conservative combination is selected here as the design basis.

7.2.2.1 PWR SNF

The PHIA00D code, described in Section 6.2 and included here as Attachment I, provides a table of assembly heat production as a function of time in a format suitable for direct use by the engineering analysis software ANSYS. PHIA00D requires as input the assembly age, burnup, enrichment, and uranium mass. Assuming the design basis assembly uranium mass from the previous section (464 kg) and an average enrichment for each burnup considered (see Assumption 4.3.8), the independent variables are reduced to age and burnup. Since the tables (Attachment III) utilized by the GETHEAT function allow for PWR burnups up to 60 GWd/MTU, a range of burnups of 10, 20, 30, 40, 50, and 60 GWd/MTU were considered. As indicated in Section 4.1 and Assumption 4.3.1, PWR waste packages will have a maximum initial assembly heat output of 850 watts or 1500 watts. Table 7.2-4 indicates the age and burnup combinations that result in an initial heat of 850 watts and 1500 watts and the attachment number for each resulting PHIA00D output file (representing the heat decay curve for each combination of assembly characteristics).

Table 7.2-4. Potential PWR Design Basis SNF Age/Burnup Combinations

Burnup	850 W (Initial Heat) Assembly		1500 W (Initial Heat) Assembly	
	SNF Age *	Included here as:	SNF Age *	Included here as:
10 GWd/MTU	2.1774 years	Attachment IV	1.3574 years	Attachment X
20 GWd/MTU	3.2594 years	Attachment V	2.0912 years	Attachment XI
30 GWd/MTU	4.4250 years	Attachment VI	2.6876 years	Attachment XII
40 GWd/MTU	6.5969 years	Attachment VII	3.4801 years	Attachment XIII
50 GWd/MTU	11.1743 years	Attachment VIII	4.5045 years	Attachment XIV
60 GWd/MTU	19.7615 years	Attachment IX	6.0238 years	Attachment XV

* Consistent with values in attachments, ages are reported to 4 decimal places to produce heat output as close to the target as possible.

Figure 7.2-1 compares the potential design basis heat outputs as a function of time for the assemblies with an initial heat of 850 watts. While all of the curves start at exactly 850 watts, the assemblies with higher burnups (and corresponding older ages) have greater heat production during later years. Thus, the highest burnup, 60 GWd/MTU, will result in the highest long term heat production and is the most conservative combination of characteristics for an initial heat of 850 watts. Likewise, as seen in Figure 7.2-2, the highest burnup of 60 GWd/MTU results in the most conservative combination of characteristics for an initial heat of 1500 watts as well. Further, only the 60 GWd/MTU burnup results in a 1500 watt assembly that is at least 5 years old. Therefore the heat decay tables provided by Attachments IX and XV provide the appropriate design basis PWR heat decay curves for waste packages with initial assembly heats of 850 and 1500 watts, respectively.

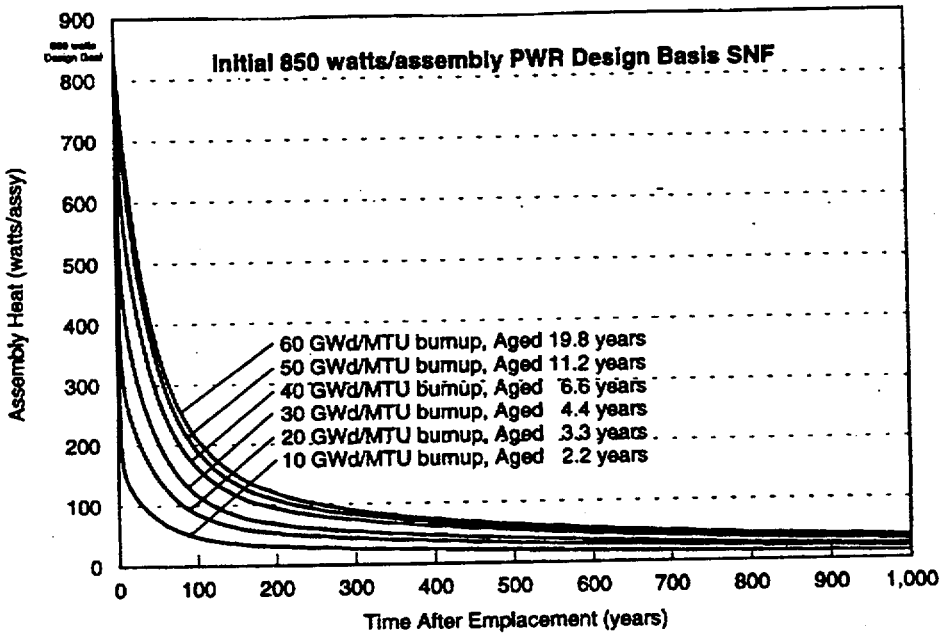

Figure 7.2-1. PWR Design Basis Heat Comparison (850 watts Initial)

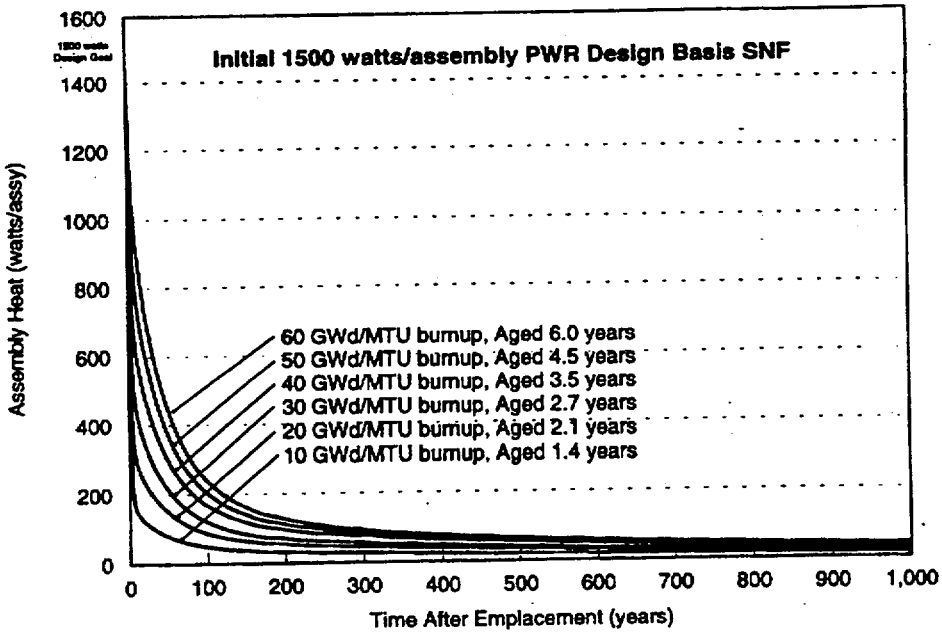

Figure 7.2-2. PWR Design Basis Heat Comparison (1500 watts Initial)

7.2.2.2 South Texas SNF

The comparison of assembly heat as a function of time for South Texas assemblies will have similar results as that for the other PWR assemblies. Therefore, only one burnup, 60 GWd/MTU, was considered; and the resulting decay heat table (Attachment XVI) provides the appropriate design basis PWR heat decay curve for the South Texas waste package described in Table 4.1-1. Assuming the South Texas design basis assembly uranium mass (544 kg) and an average enrichment for the burnup considered (see Assumption 4.3.8), the PHIA00D code provides a table of assembly heat production as a function of time in a format suitable for direct use by the engineering analysis software ANSYS. Table 7.2-5 indicates the age and burnup combination that result in a South Texas assembly initial heat of 1500 watts and the attachment number for the resulting PHIA00D output file.

Table 7.2-5. Potential South Texas Design Basis SNF Age/Burnup Combinations

Burnup	1500 W (Initial Heat) Assembly	
	SNF Age *	Included here as:
60 GWd/MTU	7.8107 years	Attachment XVI

* Consistent with values in attachments, ages are reported to 4 decimal places to produce heat output as close to the target as possible.

7.2.2.3 BWR SNF

As for PWR assemblies, the PHIA00D code, described in Section 6.2 and included here as Attachment I, was used to calculate a table of assembly heat production as a function of time for potential design basis BWR assemblies. PHIA00D requires as input the assembly age, burnup, enrichment, and uranium mass. Assuming the design basis BWR assembly uranium mass (200 kg) and an average enrichment for each burnup considered (see Assumption 4.3.8), the independent PHIA00D input parameters are age and burnup. Since the tables (Attachment III) utilized by the GETHEAT function allow for BWR burnups up to 50 GWd/MTU, a range of burnups of 10, 20, 30, 40, and 50 GWd/MTU were considered. As indicated in Section 4.1, BWR waste packages will have a maximum initial assembly heat output of 400 watts or 520 watts. Table 7.2-6 indicates the age and burnup combinations that result in an initial heat of 400 watts and 520 watts and the attachment number for each resulting PHIA00D output file (representing the heat decay curve for each combination of assembly characteristics).

Table 7.2-6. Potential BWR Design Basis SNF Age/Burnup Combinations

Burnup	400 W (Initial Heat) Assembly		520 W (Initial Heat) Assembly	
	SNF Age *	Included here as:	SNF Age *	Included here as:
10 GWd/MTU	1.9978 years	Attachment XVII	1.5742 years	Attachment XXII
20 GWd/MTU	2.9174 years	Attachment XVIII	2.3440 years	Attachment XXIII
30 GWd/MTU	3.9422 years	Attachment XIX	3.0870 years	Attachment XXIV
40 GWd/MTU	7.8481 years	Attachment XX	5.2248 years	Attachment XXV
50 GWd/MTU	10.9614 years	Attachment XXI	6.4042 years	Attachment XXVI

* Consistent with values in attachments, ages are reported to 4 decimal places to produce heat output as close to the target as possible.

Figure 7.2-3 compares the potential design basis heat outputs as a function of time for the assemblies with an initial heat of 400 watts. As for the PWR assemblies, the assemblies with higher burnups (and corresponding older ages) have greater heat production during later years. Thus, the highest burnup, 50 GWd/MTU, will result in the highest long term heat production and is the most conservative combination of characteristics for an initial heat of 400 watts. Likewise, as seen in Figure 7.2-4, the highest burnup of 50 GWd/MTU results in the most conservative combination of characteristics for an initial heat of 520 watts as well. Therefore the heat decay tables provided by Attachments XXI and XXVI provide the appropriate design basis BWR heat decay curves for waste packages with initial assembly heats of 400 and 520 watts, respectively.

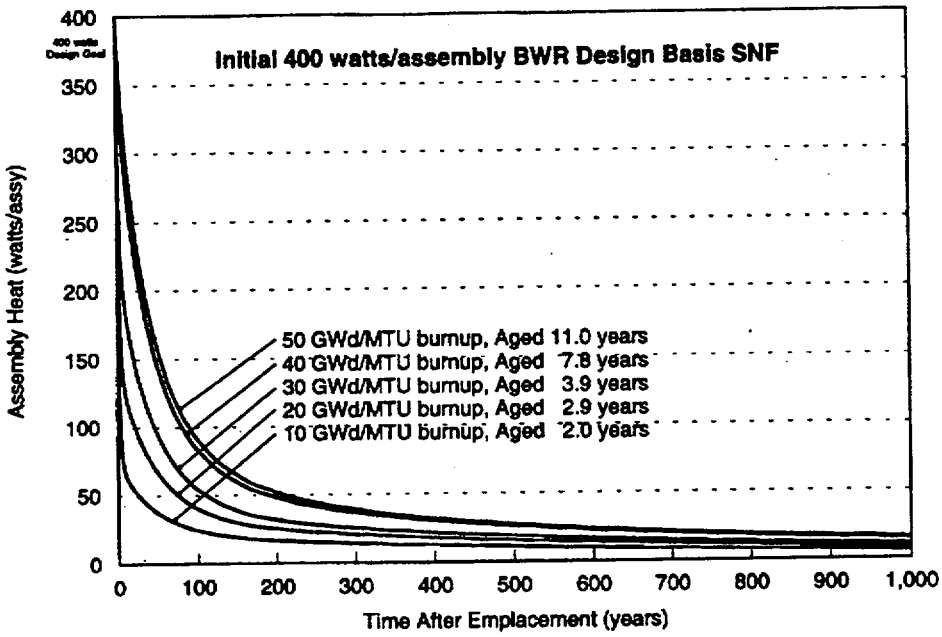

Figure 7.2-3. BWR Design Basis Heat Comparison (400 watts Initial)

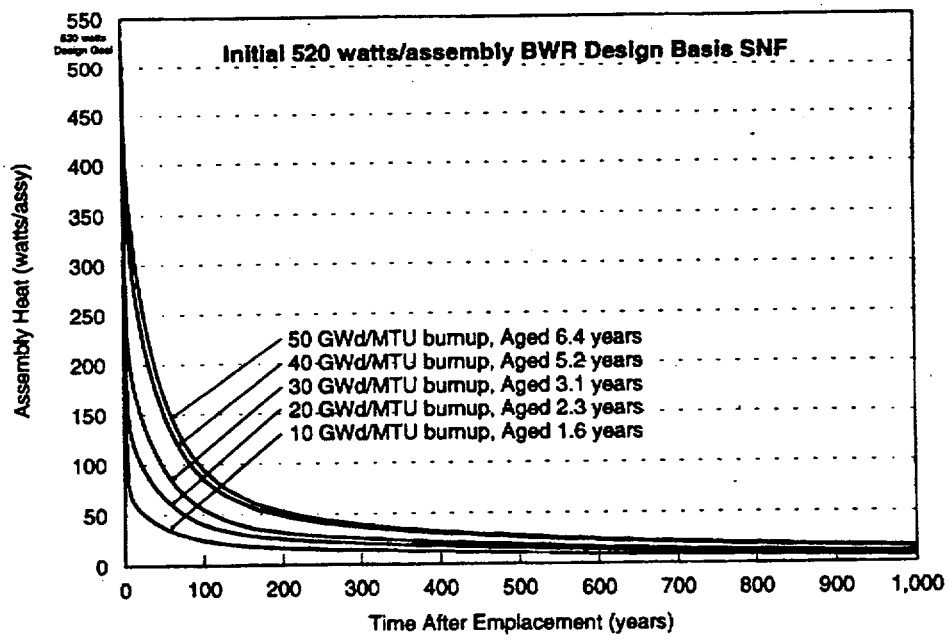

Figure 7.2-4. BWR Design Basis Heat Comparison (520 watts Initial)

7.3 Determination of Average SNF

Eight potential waste stream cases were used as input to the Determination of Waste Package Design Configurations (Ref. 5.11). These eight cases were subsequently updated and expanded by Systems Engineering to become twelve waste stream cases (Ref. 5.5) and these were the final input to the Waste Quantity, Mix and Throughput Study Report (Ref. 5.20). To be consistent with the conclusions of the Throughput Study, the twelve cases have been reevaluated using the WP loading program, WPBIN00D, and the resulting coverages (numbers of assemblies placed in each WP type) are reported here (see Assumption 4.3.9). In addition, calculations of average heat output for total waste stream inventory and for individual WP design types were performed as part of the WPBIN00D program, described in Section 6.2. The parameters assumed to develop the twelve waste stream cases (p. 1, Ref. 5.5) are listed here in Table 7.3-1.

Table 7.3-1. Description of Potential Waste Stream Scenarios for Commercial SNF

Scenario	Interim Storage Facility	Acceptance Order	Total Accepted (MTU)	Unload Pool to Dry Storage after Reactor Shutdown	Cask Type for Reactor Dry Storage	Cask Type for Shipment from Reactor	
						To ISF	To MGDS
Case 1	Yes	YFF10	63,000	Yes	DPC	DPC	UCF
Case 2	Yes	YFF10	63,000	No	SPC	DPC 2 years, then UCF	UCF
Case 3	No	YFF10	63,000	No	SPC	N/A	DPC 2 years, then UCF
Case 4	No	YFF10	63,000	No	SPC	N/A	UCF
Case 5	Yes	OFF	63,000	Yes	DPC	DPC	UCF
Case 6	Yes	OFF	63,000	No	SPC	DPC 2 years, then UCF	UCF
Case 7	No	OFF	63,000	No	SPC	N/A	DPC 2 years, then UCF
Case 8	No	OFF	63,000	No	SPC	N/A	UCF
Case 9	Yes	YFF10	86,800	Yes	DPC	DPC	UCF
Case 10	No	YFF10	86,800	No	SPC	N/A	UCF
Case 11	Yes	OFF	86,800	Yes	DPC	DPC	UCF
Case 12	No	OFF	86,800	No	SPC	N/A	UCF

Note: ISF = Interim Storage Facility
YFF10 = Youngest Fuel First at least 10 years old
DPC = Dual Purpose Canister
UCF = Uncanistered SNF
OFF = Oldest Fuel First
SPC = Single Purpose

7.3.1 Total Inventory Average Characteristics

The WPBIN00D code, described in Section 6.2 and included here as Attachment II, provides a sorting of PWR and BWR assemblies in increments of 10 watts (of initial heat production) and increments of criticality potential (measured by $k_{infinity}$, see Assumption 4.3.10). This sorting method provides information about the range of assembly characteristics and was part of the basis for the WP types selected in Reference 5.11. The WPBIN00D program also provides a table of average assembly heat production (for PWRs and BWRs) as a function of time in a format suitable for direct use by the engineering analysis software ANSYS. To create this heat output data file, the WPBIN00D program averages the predicted heat decay curve (using GETHEAT) for each batch of discharged SNF in the waste stream file, with time for each decay curve normalized to time of emplacement. This data file provides the heat production table for use in a thermal analysis of an average (nominal) PWR or BWR waste package emplaced in the potential repository, and does not depend upon any particular WP loading strategy (see next section). Table 7.3-2 indicates the average initial assembly heat production (for PWR and BWR assemblies) and the attachment number for each resulting WPBIN00D output file.

Table 7.3-2. Average Initial Assembly Heat for Each Waste Stream Case

Scenario	Input and Output File Included here as:	Average Initial PWR Assembly Heat	Average Initial BWR Assembly Heat	Heat Output Data Table Included here as:
Case 1	Attachment LIV	476.02 watts	174.51 watts	Attachment XXVII
Case 2	Attachment LV	483.64 watts	181.38 watts	Attachment XXVIII
Case 3	Attachment LVI	536.19 watts	202.47 watts	Attachment XXIX
Case 4	Attachment LVII	535.93 watts	202.46 watts	Attachment XXX
Case 5	Attachment LVIII	450.30 watts	167.91 watts	Attachment XXXI
Case 6	Attachment LIX	452.43 watts	173.14 watts	Attachment XXXII
Case 7	Attachment LX	477.44 watts	180.83 watts	Attachment XXXIII
Case 8	Attachment LXI	477.48 watts	180.85 watts	Attachment XXXIV
Case 9	Attachment LXII	511.58 watts	183.06 watts	Attachment XXXV
Case 10	Attachment LXIII	497.48 watts	183.74 watts	Attachment XXXVI
Case 11	Attachment LXIV	506.90 watts	183.00 watts	Attachment XXXVII
Case 12	Attachment LXV	472.71 watts	173.38 watts	Attachment XXXVIII

While the average initial assembly heat can vary by as much as 20%, the average assembly heat outputs do not vary significantly between the potential waste stream cases when viewed over a thousand years. Figures 7.3-1 and 7.3-2 compare the average assembly heat production as a function of time for each waste stream case for PWRs and BWRs, respectively. The figures show that, when viewed on a long-term time scale, it is difficult to differentiate the average characteristics from each of the potential waste streams. While certain waste stream scenarios can lead to generally hotter (or cooler) waste packages at the time of emplacement, the very-long term response of the repository as a whole (the thermal loading effect on the far-field) is relatively insensitive to some of the assumptions used to estimate what order the assemblies will be shipped from the reactor sites to the potential repository. However, this does not imply that waste stream assumptions will not impact peak temperatures in the near-field, as previous scoping thermal evaluations (p. 5-51, Ref. 5.30) indicate that peak drift temperatures were around 10°C cooler with an OFF waste stream compared to a YFF10 waste stream.

Twelve potential commercial SNF waste stream cases (developed in Ref. 5.5) were considered in this evaluation. The sorting provided by the WPBIN00D program requires the information described in Assumptions 4.3.9 through 4.3.13 and is assumed acceptable for characterizing the projected receipt of SNF assemblies. Of the twelve potential commercial SNF waste stream scenarios, "Case 1" was selected in the Throughput Study as a recommended repository design reference (Section 5.6.1, Ref. 5.20). Therefore, the average assembly heat data file resulting from the analysis of "Case 1", included here as Attachment XXVII, provides the appropriate average PWR and BWR heat decay curves for thermal analyses that do not distinguish different waste package types.

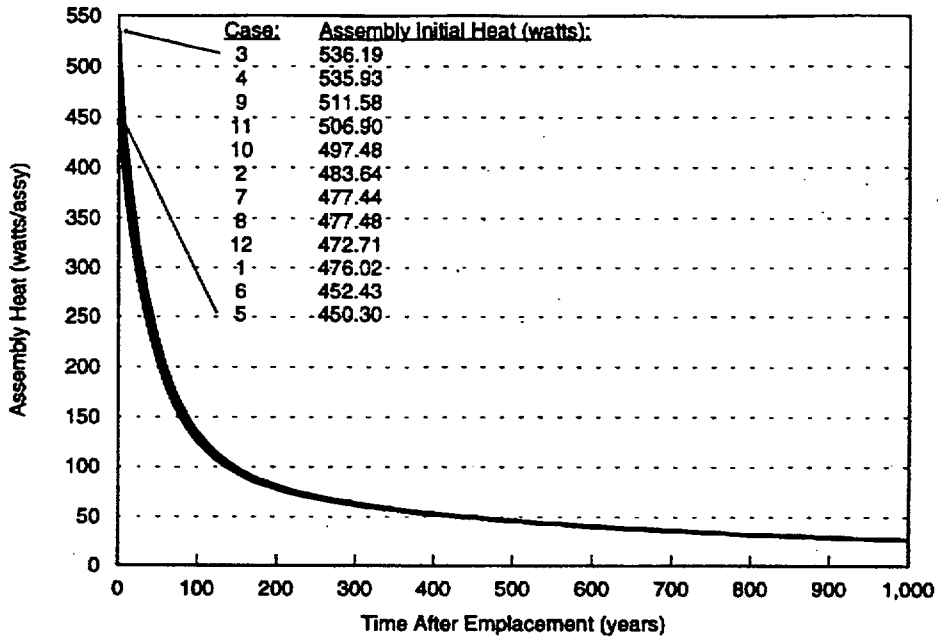

Figure 7.3-1. Average PWR SNF Heat Comparison

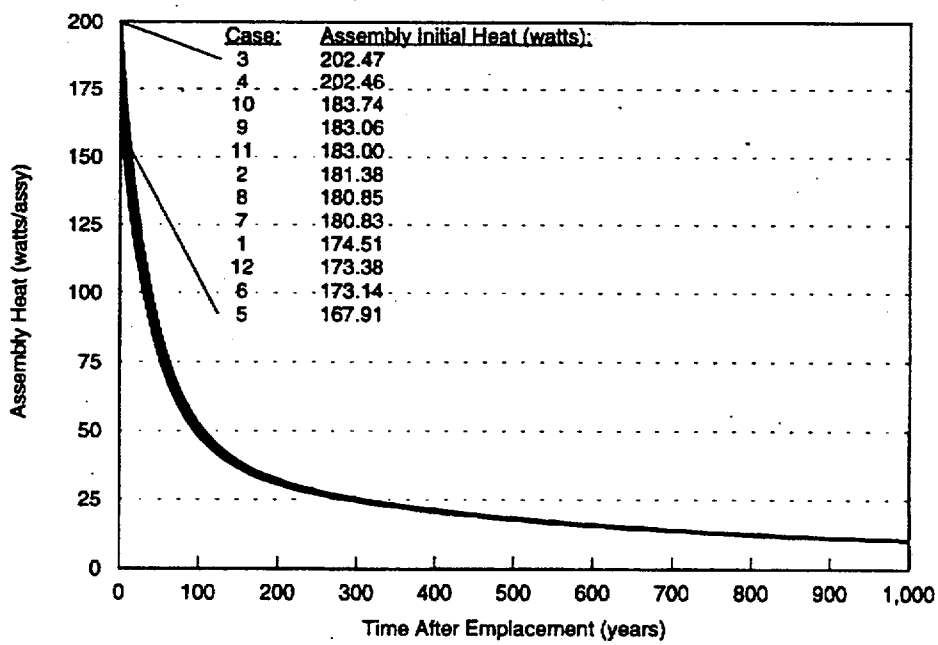

Figure 7.3-2. Average BWR SNF Heat Comparison

7.3.2 Waste Package Average Characteristics

In addition to the sorting of PWR and BWR assemblies as a function of characteristics performed in the previous section, the WPBIN00D code also provides a sorting of assemblies into specified WP design types with statistics of waste stream coverage and estimates of the number of each WP type needed during each year of repository emplacement. The WPBIN00D program also provides a table of average assembly heat production (for each WP type described in Table 4.1-1) as a function of time in a format suitable for direct use by the engineering analysis software ANSYS. To create this heat output data file, the WPBIN00D program averages (for the assemblies loaded into each WP type) the predicted heat decay curve normalized to time of emplacement. This data file provides the heat production table for use in a thermal analysis that includes average (nominal) examples of each WP design type. Table 7.3-3 compiles the number of resulting waste packages, unbinned assemblies (see Assumption 4.3.14), and output file attachment numbers for each waste stream case. Unbinned assemblies and their causes are discussed in Section 7.3.3.

Table 7.3-3. Results of Waste Package Binning for Each Waste Stream Case

Scenario	Input and Output File Included here as:	Total Number of PWR WPs	Total Number of BWR WPs	Number of Unbinned Assemblies	Heat Output Data Table Included here as:
Case 1	Attachment LXVI	4745	2845	81	Attachment XXXIX
Case 2	Attachment LXVII	4729	2883	67	Attachment XL
Case 3	Attachment LXVIII	4786	2891	28	Attachment XLI
Case 4	Attachment LXIX	4783	2891	28	Attachment XLII
Case 5	Attachment LXX	4623	2841	51	Attachment XLIII
Case 6	Attachment LXXI	4602	2868	51	Attachment XLIV
Case 7	Attachment LXXII	4609	2880	7	Attachment XLV
Case 8	Attachment LXXIII	4608	2881	7	Attachment XLVI
Case 9	Attachment LXXIV	6673	3904	1733	Attachment XLVII
Case 10	Attachment LXXV	6639	3859	390	Attachment XLVIII
Case 11	Attachment LXXVI	6550	3904	1661	Attachment XLIX
Case 12	Attachment LXXVII	6479	3858	240	Attachment L

Twelve potential commercial SNF waste stream cases (developed in Ref. 5.5) were considered in this evaluation. The sorting provided by the WPBIN00D program requires the information described in Assumptions 4.3.9 through 4.3.13 and is assumed acceptable for characterizing the projected receipt of SNF assemblies. Of the twelve potential commercial SNF waste stream scenarios, "Case 1" was selected in the Throughput Study as a recommended repository design reference (Section 5.6.1, Ref. 5.20). Therefore, the average waste package heat data file resulting from the analysis of "Case 1", included here as Attachment XXXIX, provides the appropriate heat decay curves for thermal analyses that distinguish between different waste package types. Attachment XXXIX provides the average assembly heat output as a function of time for each of the eight specified waste package design types. The calculated average assembly heat can vary significantly between WP types, as seen in Figure 7.3-3, and the differences can persist for thousands of years. Calculated average waste package statistics for waste stream "Case 1" are also provided in Table 7.3-4 (see Attachment LXVI). The coverage range indicates the number of waste packages of each design type and the percentage of assemblies (for PWRs and BWRs) captured by that design type.

Table 7.3-4 also provides the average uranium mass loading (based on the initial uranium mass loading of the average assemblies) for each WP type (see Attachment LIV). The average mass provides a method for determining the nominal (or average) WP emplacement spacing in a repository design where loading is based on the WP mass (MTU/acre for example). As seen in the difference between average and design basis heat output in Table 7.3-4, considerable variability in WP heat output is expected for each of the WP types. Section 7.5 provides some discussion as to how this heat output variability could be accommodated.

Table 7.3-6 tabulates the numbers of each WP type ready to be emplaced during each year of repository emplacement operations. Extra assemblies (those that would result in a partially filled WP) are carried to the next year such that no partially filled WPs are created until the last year of receipt for a given WP type. This concept would require that assemblies that do not fill a complete WP are held in lag storage until more of the same type are received. The holding time could be as long as four years dependent entirely upon the projected shipment dates estimated by waste stream "Case 1". While the scope of SNF storage at the repository surface facility is still under consideration, the alternative would result in hundreds of partially filled packages (thus increasing the number of WPs and costs). The impact to surface facility design is discussed in other design analyses.

Table 7.3-4. WP Design Coverage for Waste Stream Case 1

WP Types:	ID:	Coverage Range # of WPs	Coverage Range % SNF *	Average MTU/WP	Average Initial WP Heat Output	Design Basis Initial WP Heat Output
21 PWR - No Absorber (base thermal & criticality)	1	1444	31.96%	8.988 MTU	10.272 kW	17.850 kW
21 PWR - Absorber Plates (criticality option 1)	2	2641	58.47%	9.051 MTU	9.120 kW	17.850 kW
21 PWR - Absorber Rods, No Plates (criticality option 2)	3	120	2.66%	8.148 MTU	2.905 kW	17.850 kW
12 PWR - No Absorber (thermal option 1)	4	390	4.93%	5.436 MTU	11.231 kW	18.000 kW
12 PWR - Long, Absorber Plates (base South Texas long WP)	5	150	1.90%	6.468 MTU	10.477 kW	18.000 kW
44 BWR - No Absorber (base thermal & criticality)	6	696	24.61%	7.656 MTU	11.625 kW	17.600 kW
44 BWR - Absorber Plates (criticality option 1)	7	2107	74.59%	7.876 MTU	6.440 kW	17.600 kW
24 BWR - Thick Absorber Plates (thermal option 1, criticality option 2)	8	42	0.80%	3.960 MTU	0.933 kW	12.480 kW

* Percent of PWR or BWR waste stream accommodated.

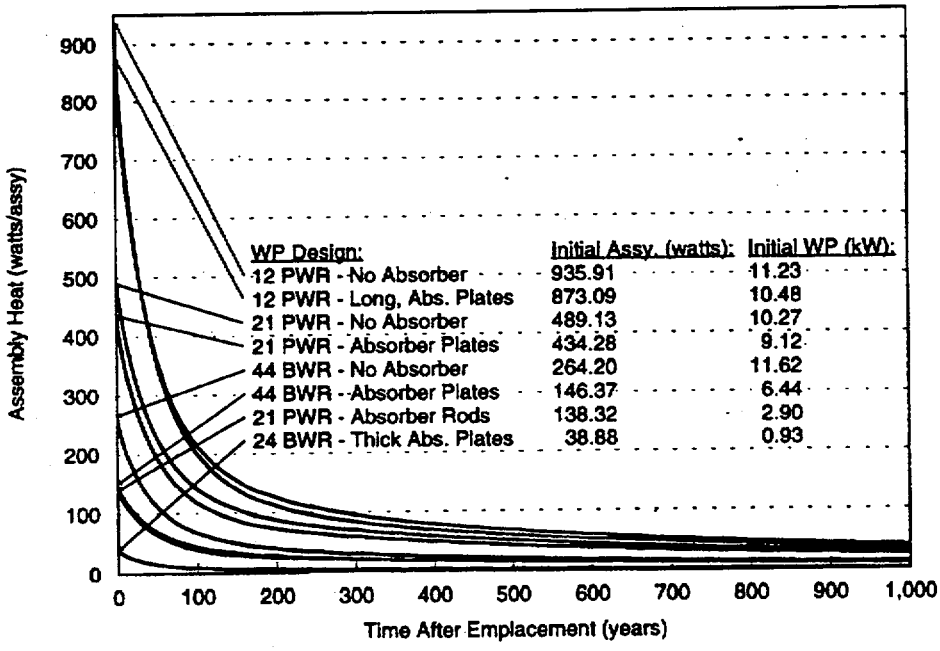

Figure 7.3-3. Average Assembly Heat for Each WP for Case 1

Table 7.3-5 summarizes the average SNF assembly characteristics for each of the commercial SNF WP design types. Table 7.3-5 lists the average age, burnup, enrichment, uranium mass, and initial heat output resulting from all of the assemblies placed in each WP type. These values are taken from the WPBIN00D output included here as Attachment XXXIX. Table 7.3-5 also lists the average assembly characteristics for all of the PWR and BWR assemblies emplaced in the MGDS (Attachment XXVII). Within the WPBIN00D program, assembly age and initial heat output are calculated based upon assembly characteristics and the year each assembly is emplaced; then averages are calculated and printed. It is important to note that the average assembly characteristics, such as average age or burnup, can be misleading for two reasons. First, the estimated heat output of an SNF assembly with average characteristics is not necessarily the same as the average of the individual assembly heat outputs. Second, there is still a wide range (variability) in the assembly characteristics for each WP design type, such that the average assembly characteristics cannot be considered "nominal" parameters for design.

Table 7.3-5. Average WP Assembly Characteristics for Waste Stream Case 1

WP Types:	ID:	Average Assembly Age	Average Assembly Burnup	Average Assembly Enrichment	Average MTU per Assembly	Average Initial Heat Output
21 PWR - No Absorber base thermal & criticality)	1	27.920 years	44,102 MWd/MTU	3.723%	0.428 MTU	489.13 watts
21 PWR - Absorber Plates (criticality option 1)	2	26.340 years	36,662 MWd/MTU	3.638%	0.431 MTU	434.28 watts
21 PWR - Absorber Rods, No Plates (criticality option 2)	3	35.694 years	17,418 MWd/MTU	3.462%	0.388 MTU	138.32 watts
12 PWR - No Absorber (thermal option 1)	4	10.369 years	52,966 MWd/MTU	4.247%	0.453 MTU	935.91 watts
12 PWR - Long, Absorber Plates (base South Texas long WP)	5	15.944 years	44,782 MWd/MTU	3.887%	0.539 MTU	873.09 watts
44 BWR - No Absorber (base thermal & criticality)	6	18.753 years	42,164 MWd/MTU	3.319%	0.174 MTU	264.20 watts
44 BWR - Absorber Plates (criticality option 1)	7	29.878 years	29,421 MWd/MTU	2.910%	0.179 MTU	146.37 watts
24 BWR - Thick Absorber Plates (thermal option 1, criticality option 2)	8	18.139 years	8,836 MWd/MTU	3.468%	0.165 MTU	38.88 watts
All PWR Assemblies (including South Texas assemblies		26.098 years	39,495 MWd/MTU	3.696%	0.432 MTU	476.02 watts
All BWR Assemblies		27.046 years	32,393 MWd/MTU	3.015%	0.177 MTU	174.51 watts

Table 7.3-6. Waste Packages Completed Each Year for Waste Stream Case 1

Year	21 PWR No Absorber	21 PWR Absorber Plates	21 PWR Control Rods	12 PWR High Heat	12 PWR South Texas	44 BWR No Absorber	44 BWR Absorber Plates	24 BWR Thick Absorbers
2010	2	16	0	1	0	2	10	0
2011	4	26	4	2	0	12	24	0
2012	19	56	0	9	6	19	38	0
2013	29	93	9	22	15	22	52	0
2014	44	149	6	30	0	36	96	0
2015	49	155	1	21	12	34	88	0
2016	57	130	2	31	7	40	95	0
2017	43	151	3	32	15	33	89	0
2018	52	132	3	31	12	49	85	0
2019	49	139	7	34	12	31	91	0
2020	50	138	5	35	8	34	95	0
2021	61	127	2	29	8	33	95	4
2022	61	130	3	37	10	37	78	14
2023	59	133	11	25	9	38	84	0
2024	62	118	14	25	10	43	83	8
2025	58	116	4	26 *	9	53	96	11
2026	76	94	20	0	0	12	176	2
2027	113	83	6	0	0	30	133	0
2028	92	109	2	0	0	16	134	0
2029	89	119	2	0	0	18	118	0
2030	87	128	4	0	0	27	110	2
2031	111	118	3	0	0	34	82	1 *
2032	105	118	6	0	14	30	84	0
2033	72 *	63 *	3	0	3	13 *	71 *	0
Total	1444	2641	120	390	150	696	2107	42

* Indicates that last WP is partially filled

CDA assumption Key 003 (Ref. 5.9) indicates slightly different totals for waste packages produced for waste stream "Case 1". This difference can be traced to the results of the Waste Quantity, Mix and Throughput Study Report (Ref. 5.20) where, at the end of each emplacement year, the number of filled WPs are "rounded-up" to make the results more conservative. This assumption is not used in this design analysis as there is no reason to emplace partially filled WPs at the end of each calendar year. The WP binning and heat averaging calculations performed by WPBIN00D utilize the original waste stream cases (Ref. 5.5), and do not "round-up" any numbers in the calculations.

Emplacing partially filled WPs is not considered a cost effective utilization of WP materials. Nevertheless, a comparison calculation was performed to determine the number of WPs emplaced when partially filled WPs are created at the end of each year of emplacement. Table 7.3-7 tabulates the numbers of each WP type ready to be emplaced during each year of repository emplacement operations. Partially filled WPs are closed and emplaced at the end of each calendar year and result in hundreds of partially filled packages (6 partially filled WPs are indicated in Table 7.3-6). However, the resulting 77 additional WPs will not significantly impact the average heat output for each WP type calculated in this section.

Table 7.3-7. Waste Packages Completed Each Year for CDA Assumption Key 003 (Ref. 5.9)

Year	21 PWR No Absorber	21 PWR Absorber Plates	21 PWR Control Rods	12 PWR High Heat	12 PWR South Texas	44 BWR No Absorber	44 BWR Absorber Plates	24 BWR Thick Absorbers
2010	3	17	1	2	0	3	11	0
2011	4	27	5	2	0	13	24	0
2012	19	56	0	9	7	20	38	0
2013	29	94	9	23	15	22	53	0
2014	45	150	7	30 *	0	37	96	0
2015	50	155	1	22	12 *	34	89	0
2016	57	131	3	32	8	41	96	0
2017	43	152	3	32	15	33	89	0
2018	52	133	4	31 *	12 *	49	86	0
2019	49	139	7	35	13	32	91	0
2020	51	138	5	36	8	35	95	0
2021	62	128	3	29	8 *	33	95	5
2022	61	131	3	38	11	38	79	15
2023	59	133	12	25	9 *	38	85	1
2024	63	118 *	15	26	10	43	84	8
2025	58	117	4	26	10	54	96	12
2026	77	94	20	0	0	12	176	2 *
2027	114	83 *	7	0	0	30	134	1
2028	92	109	2	0	0	17	135	1
2029	89	120	3	0	0	18	119	1
2030	88	129	5	0	0	28	111	2
2031	112	118	3 *	0	0	34	82	1
2032	105 *	118	7	0	14 *	31	85	0
2033	72	63	3	0	3	12	70	0
Total	1454	2653	132	398	155	707	2119	49

* Indicates that last WP is completely filled

7.3.3 Disposition of Unbinned Assemblies

As seen in Table 7.3-3, a number of assemblies were found to exceed the WP loading constraints and were not placed in one of the eight commercial SNF WP designs. It was the intent of the original WP design determination (Ref. 5.11) to handle all commercial SNF assemblies; however, the number and type of outlier assemblies are subject to change with each waste stream projection. Cases 9 through 12, which include all 86,800 MTUs of SNF, had the greatest number of unbinned assemblies which generally resulted from young or partially burned fuel due to reactor shutdowns. The baseline design currently includes only the first 63,000 MTUs of SNF (Cases 1 through 8). This section describes a possible disposition of these unbinned assemblies by placing them in one of the WP designs already defined.

A listing of the number of unbinned assemblies for each waste stream case, including an estimate of heat and $k_{infinity}$, are provided in Attachments XXXIX through L. Also, a sorting of all assemblies based upon heat output and criticality potential is provided for each waste stream case in Attachments LIV through LXV. Each of the "unbinned" assemblies occurred due to one of the following four reasons:

Reason 1. PWR assemblies with estimated $k_{infinity}$ values greater than the highest PWR bin level of 1.45 (see Table 4.1-1).

For some of the cases, eight PWR assemblies were found to exceed the $k_{infinity}$ bin by 0.01. Since the $k_{infinity}$ determination is merely an estimate, and the waste stream is largely based on projections, it is reasonable to assume that, when present, these eight assemblies would be captured by the 21 PWR with control rods WP design (the third WP type). For each waste stream case, this would result in the following changes:

Case:	Impact:
1:	1 more 21 PWR w/ control rods WP partially filled with 8 assemblies
2:	8 assemblies placed in the last partially filled 21 PWR w/ control rods WP
3:	No change
4:	No change
5:	8 assemblies placed in the last partially filled 21 PWR w/ control rods WP
6:	8 assemblies placed in the last partially filled 21 PWR w/ control rods WP
7:	No change
8:	No change
9:	8 assemblies placed in the last partially filled 21 PWR w/ control rods WP
10:	No change
11:	1 more 21 PWR w/ control rods WP partially filled with 8 assemblies
12:	No change

Reason 2. South Texas (STx) assemblies with estimated $k_{infinity}$ values greater than the highest South Texas bin level of 1.13 (see Table 4.1-1).

For some of the cases, several South Texas assemblies were found to exceed the $k_{infinity}$ bin by as much as 0.136. It is likely that in the future, a new WP design type indicating a South Texas option with criticality control rods will be specified. However, for the same reasons above, it is reasonable to assume (for now) that, when present, these assemblies would be captured by the 12 PWR STx WP (the fifth WP type) or one very similar to it. For each waste stream case, this would result in the following changes:

Case:	Impact:
1:	No change
2:	No change
3:	No change
4:	No change
5:	3 more 12 PWR STx WPs with 7 assemblies placed in a previously partially filled WP
6:	3 more 12 PWR STx WPs with 7 assemblies placed in a previously partially filled WP
7:	7 assemblies placed in the last partially filled 12 PWR STx WP
8:	7 assemblies placed in the last partially filled 12 PWR STx WP
9:	14 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies and 7 assemblies placed in a previously partially filled WP
10:	14 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies and 7 assemblies placed in a previously partially filled WP
11:	13 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies and 9 assemblies placed in a previously partially filled WP
12:	10 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies and 9 assemblies placed in a previously partially filled WP

Reason 3. PWR assemblies with heat production greater than the highest PWR bin level of 1500 watts.

For the waste steam cases considering the full 86,800 MTUs of projected SNF (Cases 9 through 12), a number of PWR assemblies were found to have decay heat generation greater than the secondary limit of 1500 watts. All of these "unbinned" assemblies have very young ages (near 5 years old and shipped shortly after reactor shutdown) and would not otherwise be a problem for the reference repository design which considers only the first 63,000 MTUs. While it is unlikely that assemblies generating this much heat will be shipped, the surface facility aging time required to reduce the heat production to 1500 watts is small. Even at a high burnup of 60 GWd/MTU, a five year old assembly drops to 1500 watts in a little over one year (see Table 7.2-4); and most of the unbinned assemblies generate just over 1500 watts. After aging, these assemblies would be captured by the 12 PWR high heat WP (the fourth WP type). For each waste stream case, this would result in the following changes:

Case:	Impact:
1:	No change
2:	No change
3:	No change
4:	No change
5:	No change
6:	No change
7:	No change
8:	No change
9:	13 more 12 PWR high heat WPs with the last WP partially filled with 2 assemblies and 8 assemblies placed in a previously partially filled WP
10:	3 more 12 PWR high heat WPs with the last WP partially filled with 1 assembly and 8 assemblies placed in a previously partially filled WP
11:	13 more 12 PWR high heat WPs with 5 assemblies placed in a previously partially filled WP
12:	2 more 12 PWR high heat WPs with 9 assemblies placed in a previously partially filled WP

Reason 4. PWR assemblies that require criticality control but are too hot for the large WP with criticality control plates or control rods.

For some of the cases, many PWR assemblies were found to have decay heat generations greater than the primary limit of 850 watts and $k_{infinity}$ values greater that the 1.02 limit for the 12 PWR high heat WP (the fourth WP type). If future projections of the waste stream predict that a significant number of assemblies in this category persist, then a 12 PWR WP design with neutron absorbers could be specified. However, there are two alternatives: **Option 4.A)** the assemblies could be placed in the 12 PWR South Texas WP (the fifth WP type), or **Option 4.B)** the assemblies could be aged until their heat output reaches 850 watts and then placed in the 21 PWR WP w/ absorber plates (the second WP type). Assuming a high burnup of 60 GWd/MTU, it could take up to 15 years for an assembly to cool from 1500 watts to 850 watts (see Attachment XV). However, many of these assemblies are just over the heat limit of 850 watts and require less than a year of aging.

Option 4.A) Utilizing the South Texas WP would result in the following changes:

Case:	Impact:
1:	7 more 12 PWR STx WPs with the last WP partially filled with 1 assembly
2:	5 more 12 PWR STx WPs with the last WP partially filled with 11 assemblies
3:	3 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies
4:	3 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies
5:	No change
6:	No change
7:	No change
8:	No change
9:	117 more 12 PWR STx WPs with the last WP partially filled with 4 assemblies and 8 assemblies placed in a previously partially filled WP
10:	16 more 12 PWR STx WPs with the last WP partially filled with 2 assemblies and 8 assemblies placed in a previously partially filled WP

11: 111 more 12 PWR STx WPs with the last WP partially filled with 7 assemblies and 8 assemblies placed in a previously partially filled WP
12: 7 more 12 PWR STx WPs with the last WP partially filled with 6 assemblies and 8 assemblies placed in a previously partially filled WP

Option 4.B) Or, utilizing aging would result in the following changes:

Case:	Impact:
1:	4 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 4 assemblies and 6 assemblies placed in a previously partially filled WP
2:	2 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 20 assemblies and 18 assemblies placed in a previously partially filled WP
3:	1 more 21 PWR w/ absorber plates WP partially filled with 9 assemblies and 19 assemblies placed in a previously partially filled WP
4:	2 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 5 assemblies and 2 assemblies placed in a previously partially filled WP
5:	No change
6:	No change
7:	No change
8:	No change
9:	67 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 10 assemblies and 8 assemblies placed in a previously partially filled WP
10:	9 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 20 assemblies and 2 assemblies placed in a previously partially filled WP
11:	63 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 14 assemblies and 19 assemblies placed in a previously partially filled WP
12:	4 more 21 PWR w/ absorber plates WPs with the last WP partially filled with 14 assemblies with 9 assemblies placed in a previously partially filled WP

Combining the changes due to reasons 1, 2, 3, and 4 (pick 4A *or* 4B as described above) will place every "unbinned" assembly received at the repository in one of the eight commercial SNF waste package designs listed in Table 4.1-1. The additional filled packages indicated above would then be added to the WP totals of Tables 7.3-3, 7.3-4, and 7.3-6. However, the average heat outputs for each waste package type (Attachments XXXIX through L) are not expected to significantly change if these additional filled waste packages are included (see Assumption 4.3.14).

7.4 Characteristics of High-Level Waste Glass

To capture a majority of the HLW glass waste form, the waste package must be designed and evaluated to accommodate the bounding or limiting case of a glass waste form which has a thermal output much higher than average. Thus, a design basis heat load can be determined which can be considered the hottest glass waste form heat load that could be loaded and emplaced in that waste package. Subsequent waste package/engineered barrier evaluations would then represent the hottest waste package for this waste form in a repository with thermal loading otherwise dominated by SNF waste packages. While all of the waste packages (hot and cold) will collectively influence repository temperatures (assumed to be the average SNF waste package characteristics), every waste package must meet thermal goals (WP design basis heat load characteristics).

7.4.1 Design Basis HLW Canister Types and Mass

The physical dimensions of the Savannah River pour canister are assumed to represent a typical high-level waste glass waste form for the potential repository at Yucca Mountain (see Assumption 4.3.15). While detailed information about the probable glass wastes to be produced at the other generating sites is currently being collected, the Savannah River canister is the best documented design at this time. Typical dimensions for the Savannah River canister are provided in Table 4.1-5.

Decay heat within the pour canister is produced within the glass matrix which only partially fills the canister. The fill height of the glass is given in Table 4.1-5 and is based on the canister volume, the percentage loading, and the internal dimensions of the canister (see Assumption 4.3.16). It is more conservative (with respect to peak glass temperature) to assume that the heat is produced only within the glass and not distributed throughout the entire volume of the canister. Further, it also conservative to assume that energy produced by the radioactive material is deposited as heat only in the glass and not in the surrounding metal structures (Assumption 4.3.17). Since the glass is assumed to be a relatively homogeneous mixture, there will be no axial energy production profile as occurs in intact SNF, and an axial power peaking factor of 1.00 is applicable to the glass canisters (Assumption 4.3.18).

The density of the glass waste form is assumed to be 2688.6 kg/m^3 based on the nominal glass weight and volume (see Assumption 4.3.19) and the conductivity is 1.1 W/m·K (p. 584, Ref. 5.25, see Assumption 4.3.20). The Pyrex glass specific heat of 835 J/kg·K and emissivity of 0.81 are assumed to be applicable to the borosilicate glass waste form (see Assumption 4.3.21).

7.4.2 Design Basis HLW Canister Heat Output

Given that higher capacity waste packages are more likely to exceed thermal goals than smaller ones in the same repository thermal environment, the choice of a design basis heat load is important because it could limit the number of pour canisters that can be loaded in one WP without exceeding thermal goals for disposal. The limiting thermal goal for waste packages containing HLW canisters is a temperature of no more than 400°C anywhere in the glass matrix (DCWP 002, p. 8-4, Ref. 5.9). The design basis heat load will impact the timing of peak temperatures as well as the magnitude of the peak. The repository host rock temperatures will peak between 10 to 500 years depending on the thermal loading but will be largely independent of the individual waste package design. The waste package itself, however, will experience its peak temperature before the rock temperature peaks depending on the heat generated in each individual package.

Several different MGDS HLW canister design basis heat load types have been used by the OCRWM to demonstrate compliance with requirements and to allow comparison with previous evaluations. Currently, there are four sites that will manufacture high-level waste glass: Hanford, Savannah River Plant (SRP), West Valley (WV) and Idaho National Environmental and Engineering Laboratory (INEEL). Table 7.4-1 summarizes the projected HLW canister heat production as a function of time for each producer site as specified in References 5.16 (pp. 3.2-10, 3.3-12, 3.4-15, and 3.5-6) and 5.17 (see Assumption 4.3.22).

The time steps presented in Table 7.4-1 are judged to be too coarse to provide input to a time dependent thermal evaluation using the ANSYS engineering software. Therefore, a curve fit was performed to interpolate further data points creating a more detailed heat decay curve with time steps consistent with those used for commercial SNF in the previous sections. The curve fit, performed in Reference 5.31, used the MATHCAD software (see Attachments I, IV, and VII of Reference 5.31) to create a more detailed table heat production (see Attachments II, V, and VIII of Reference 5.31). The MATHCAD curve fit, using the data provided in Table 7.4-1, generated the appropriate equation coefficients for the radioactive decay equations, solved the radioactive decay equations to obtain the waste form heat generation rate versus time, and finally printed the decay heat data at the desired ANSYS time steps to an ASCII file. The MATHCAD-produced heat tables were then translated by hand into an ANSYS readable format suitable for direct inclusion in future thermal analyses (see Attachments III, VI, and IX of Reference 5.31). The attachments represent Hanford, Savannah River, and West Valley canister heat production. The INEEL glass waste form was judged to be similar enough to the West Valley glass waste form such that similar temperature histories are expected and therefore specific analysis (including the curve fit) of the INEEL data is not required (see Assumption 4.3.23).

Table 7.4-1. HLW Canister Thermal Analysis Design Bases Heat Loads (Refs. 5.16 and 5.17)

Manufacture Location	Hanford Site	Savannah River Site	Idaho National Environmental and Engineering Laboratory	West Valley Demonstration Project
Time Since Emplacement (Years)	Watts/Pour Canister	Watts/Pour Canister	Watts/Pour Canister	Watts/Pour Canister
0	869	709	339	326
1	683	627	267	319
2	595	586	230	311
5	502	527	185	290
10	439	467	157	258
15	391	418	138	230
20	349	374	123	205
30	279	301	97	164
50	181	198	61	105
100	67	75	20	37
200	19	17	2.6	8.9
300	12	7.2	0.67	5.4
500	8.7	2.7	0.24	3.7
1,000	3.9	1.1	0.11	1.9
2,000	0.86	0.72	0.06	0.7
5,000	0.08	0.54	0.04	0.33
10,000	0.06	0.43	0.033	0.26
20,000	0.05	0.30	0.023	0.18
50,000	0.04	0.16	0.012	0.08
100,000	0.04	0.11	0.008	0.04
500,000	0.07	0.05	0.003	0.04
1,000,000	0.07	0.02	0.001	0.03

The HLW glass canister heat outputs calculated in Reference 5.31 are applicable to the first 10,000 years after WP emplacement. To be consistent with the heat output tables created for the SNF, the HLW glass heat tables were extended to 1,000,000 years using the data in Table 7.4-1. A recalculation of the curve fit performed in Reference 5.31 was not performed because the heat generation of the HLW glass is so low during the extended time period.

Attachments III, VI, and IX of Reference 5.31 (heat production tables for Hanford, Savannah River, and West Valley canisters) were modified to include heat output at the additional time steps and the modified tables are included in this design analysis as Attachments LI, LII, and LIII, respectively. They are considered representative of the type of HLW glass to be emplaced in the first repository, and are considered somewhat conservative because the aging time between glass production and actual emplacement in the repository has been neglected (Assumption 4.3.24)

7.5 Assumptions for Thermal Loading

The typical first step in a thermal evaluation of emplaced WPs is to determine the effect of the WP heat on the repository host rock. The thermal response of the repository rock, both short-term and long-term, depends upon the density of waste within the repository horizon and the WP emplacement spacing strategy, typically called thermal loading because the decay heat from the waste significantly alters temperatures in the near-field and far-field. Table 7.5-1 describes three alternative emplacement strategies. The purpose of this section is to describe the three emplacement strategies and how the average assembly and WP characteristics developed in this document affect their implementation. This subject is also addressed in a recent repository design analysis (Ref. 5.38). Actual WP emplacement spacings will depend upon thermal and mass loading strategy developed in future analyses.

Table 7.5-1. Characteristics of Emplacement (Thermal Loading) Strategies

Emplacement (Thermal Loading) "Strategy"	Basis	Description
Areal Power Density (APD)	Uniform Power per Unit Area (kW/acre)	WPs are assigned area according to their heat output at the time of emplacement
Areal Mass Loading (AML)	Uniform Mass per Unit Area (MTU/acre)	WPs are assigned area according to their heavy metal mass content
Equivalent Energy Density (EED)	Uniform Heat per Unit Area (GJ/m^2)	WPs are assigned area according to their heat-producing potential integrated over a specific time period after emplacement

7.5.1 Areal Power Density (APD)

As seen in the previous sections, the decay heat of individual WPs can vary greatly depending on the age, burnup, etc. of the loaded SNF. For example, the initial heat output from a 21 PWR with absorber plates WP with design basis heat output can be more than 95% greater than average (see Table 7.3-4), which can greatly affect the early (short-term) localized temperatures within the repository. However, long-term thermal behavior of the repository rock is primarily a function of the areal mass loading or tons of SNF emplaced per unit area. The repository response will be determined more by the integrated heat (the area under the decay heat curve) from the aggregated emplaced SNF and less by the initial heat of the individual WPs. The integrated heat per MTU over 100,000 years (see Table 7.5-4) from a 21 PWR with absorber plates WP, with an assumed design basis heat output, is 58% greater than average (still a considerable amount); however, most of the large WPs will differ by much less, with the majority closer to average. Any initial variability

between WPs loaded with an equivalent MTU amount of SNF will decrease with time. Thus, an initial areal power density will become uneven over time, depending on the average characteristics assumed, and will provide an evenly distributed thermal loading only at the time of emplacement.

Early definitions of thermal loading for the Yucca Mountain Project utilized an initial areal power density (specifically, 57 kW/acre) based upon expected peak rock temperatures around small capacity, "SCP" (Ref. 5.35) concept waste packages emplaced in vertical boreholes. Subsequent design analyses led to the adoption of larger multiple barrier waste packages emplaced horizontally in the emplacement drift. Thermal analyses also indicated that, after only a few years, one can expect hot and cool regions resulting from different rates of change in decay heat output of individual WPs, which could adversely affect the predictability of long-term performance. Difficulty in predicting the decay heat output (and resulting thermal response) of each and every WP led to the use of WP emplacement spacings based upon the heavy metal mass content, described in the following section.

7.5.2 Areal Mass Loading (AML)

Over the past few years, the thermal loading of the potential repository has been defined in terms of AML for the purpose of defining repository layouts and thermal response calculation. AML is typically defined as metric tons of uranium (MTU) per acre; however, the tons of uranium is actually meant to be representative of the tons of heavy metal initially present in the nuclear fuel before it is utilized in a nuclear reactor and possibly reprocessed. AML is actually a repository "mass" loading and is related to thermal loading only by the strong correlation between uranium mass (heavy metal), enrichment, and burnup (see Assumption 4.3.8). AML provides a convenient measure for the determination of emplacement configurations accommodating a statutory 70,000 MTHM (metric tons heavy metal) within a given area.

Even with its limitations, a WP emplacement layout based on AML provides a more evenly distributed long-term thermal response, compared to APD, and allows consistent comparisons of competing proposed thermal loading strategies because the total inventory of waste (as measured in tons) does not vary with time or order of receipt. AML does not, however, provide a method for handling the variability in individual WP heat output which will certainly result in temperature variations during the early years of repository operation. Therefore, a thermal loading based on mass must be robust enough to accommodate this variability without violating the near-field thermal goals.

A loading scenario based on mass could be developed that provides a unique WP spacing for each individual WP based on that package's MTU total. This kind of scenario would require that the MTU of each WP be known in advance, and would be complex as there would be a unique WP spacing for each of the (roughly) 10,000 WPs. It is not clear at this time that calculating unique WP spacings (based upon AML) rather than categories of WP spacings based upon AML averages or ranges, would lower near-field temperature variability or improve waste isolation performance. The information needed to determine the characteristics of each individual WP to be emplaced was not

developed in this design analysis; however, it could be developed in subsequent design analyses for a single given waste stream projection and it could be developed as emplacement operations occur.

The information provided in this analysis is primarily focused on the average and bounding characteristics for each of the commercial SNF WP designs listed in Table 4.1-1. The mass-based loading scenario described here would space each of the eight commercial SNF WP design types based on the average mass for each WP type (assuming waste stream "Case 1") and an example nominal spacing (using Equation 7.5-1) for three different assumed thermal loading levels (consistent with the CDA Assumption Key 019, Ref. 5.9). It should be noted that the purpose here is not to propose a thermal loading strategy or to define the final spacings, but to provide SNF characteristics for use in developing the emplacement design.

$$AML\,(MTU/acre) = \frac{Assembly\,Uranium\,Weight\,(MTU/assembly) \times Number\,of\,Assemblies}{WP\,Spacing\,(m) \times Drift\,Spacing\,(m) \times 2.4711\times10^{-4}\,(acres/m^2)}$$

(Equation 7.5-1)

Table 7.5-2. Example AML WP Spacing for Waste Stream Case 1

WP Types:	ID:	Average MTU/WP	Nominal center-to-center WP Spacing for Assumed:		
			83 MTU/acre with 22.5 m Drift Spacing	85 MTU/acre with 28.0 m Drift Spacing	100 MTU/acre with 22.5 m Drift Spacing
21 PWR - no absorber base thermal & criticality	1	8.988 MTU	19.477 m	15.283 m	16.166 m
21 PWR - absorber plates criticality option 1	2	9.051 MTU	19.613 m	15.390 m	16.279 m
21 PWR - absorber rods (no plates) criticality option 2	3	8.148 MTU	17.656 m	13.854 m	14.655 m
12 PWR - no absorber thermal option 1	4	5.436 MTU	11.780 m	9.243 m	9.777 m
12 PWR - absorber plates base South Texas long WP	5	6.468 MTU	14.016 m	10.998 m	11.633 m
44 BWR - no absorber base thermal & criticality	6	7.656 MTU	16.590 m	13.018 m	13.770 m
44 BWR - absorber plates criticality option 1	7	7.876 MTU	17.067 m	13.392 m	14.166 m
24 BWR - thick absorber plates thermal option 1, criticality option 2	8	3.960 MTU	8.581 m	6.733 m	7.122 m

As mentioned above, an AML emplacement does not provide an explicit method for handling the variability in individual WP heat output. With all of the WPs of a given design type emplaced with the same spacing, there will be heat output variability that is bounded by the design basis heat output and represented by the average heat output (see Table 7.3-4). The design basis heat output is the limiting case (that is, by definition no WPs of that type will generate more heat) and does not "represent" any portion of the waste stream; it represents only the hottest possible WP of that design type. This definition of "the hottest WP" is necessary for design because every WP must be shown to meet thermal goals and requirements (using design basis SNF characteristics), while all of the WPs (hot and cold) will collectively influence long-term repository temperatures (based on average SNF characteristics).

Future thermal calculations must demonstrate that the AML emplacement design based on fixed WP spacings for each design type (the solution described here) is robust enough to accommodate heat output variability without violating near-field thermal goals. It is estimated that all of the spacings listed in Table 7.5-2 may be acceptable (in terms of thermal limits) since the minimum 21 PWR/44 BWR WP spacing is more than a meter greater than the absolute minimum WP spacing of 12 meters specified for those WPs for ACD (p. 6.2-41, Ref. 5.6). The spacings are also comparable to previous emplacement spacing calculations (Table 7.4-8, Ref. 5.38) which utilized older waste stream projections. However, confirming thermal analysis calculations must be performed to ensure temperature limits and performance goals are met.

The last issue for AML emplacement design is the handling of DHLW WPs. DHLW WPs may represent between a quarter and a third of the total number of WPs; however, the heat output contribution is a much smaller fraction of the total. This is especially true over hundreds to thousands of years where the integrated heat output of a glass canister is much less than for SNF and will contribute very little to the long-term repository thermal response. Also, the DHLW WP technically contains no MTUs (because of the processing) and may not factor into a thermal loading based on MTU. For these reasons, it would be desirable to allocate no additional emplacement spacing for DHLW WPs, and to simply place the DHLW WPs between commercial SNF WPs where possible. The resulting AML calculation would then be based solely on commercial SNF, a practice consistent with previous (historical) thermal loading calculations and system studies where HLW canisters were neglected entirely. This emplacement scenario is also consistent with the approach described in the Repository Thermal Loading Management Analysis (Ref. 5.38).

Based upon discussions of WP sizes and emplacement methodology in MGDS ACD Report (Ref. 5.6), it may be difficult to place the WPs closer than one meter apart. Therefore, given typical ACD WP lengths, the placement of DHLW WPs between SNF WPs is more compatible with the 21 PWR/44 BWR SNF WPs than with the 12 PWR/24 BWR SNF WPs. Since there are relatively few 12 PWR/24 BWR SNF WPs, there should be no problem accommodating all of the DHLW in this fashion.

7.5.3 Equivalent Energy Density (EED)

The EED approach is a compromise between the APD and AML methods, and it has been suggested as an alternative to the current AML methodology (Ref. 5.38). The EED method is the most direct consideration of the impact of WP heat output on repository thermal response and explicitly ties the subsurface design, size, and layout to the projected decay heat output of the waste stream. Thus, the thermal strategy effectively drives the design instead of the mass and volume of waste to be disposed of in the first geologic repository.

Among the biggest problems with the EED (and the APD as well) is that the projected repository layout and WP density will vary with the constantly changing assumptions used to generate the waste stream characteristics. This is also a problem for the mass loading scenario (AML), but the impact is greater for the heat based emplacement scenarios (EED and APD). Particularly, if emplacement operations were to be delayed or if waste receipt rates were to change from year to year, the resulting emplacement layout would change considerably. This would not occur for a mass based emplacement as the waste mass does not vary with time. Regardless of the limitations, the EED method is a significant improvement over APD and places an emphasis on achieving a particular thermal strategy, which may be considered integral to the waste isolation strategy. Whether the waste isolation strategy includes a thermal strategy or not, it is not possible to emplace 70,000 MTHM in any reasonable repository area without significantly disturbing the host rock temperature and humidity. The project is in the process of determining how the heat can be used constructively to enhance radionuclide containment; however, those issues are not developed here.

A key element of concern for the EED method is the time, or deposition period, over which the total energy is to be equalized. The repository responds to the heat in different ways depending on the time period in question. Peak temperatures within the WP occur in the first couple years, emplacement drift wall temperatures peak in tens of years, average rock temperatures peak in hundreds of years, and the repository horizon drops below the boiling point in thousands of years. Thus, the selection of a deposition period (the heat integration time) will depend on the thermal strategy. Over very short time periods, the EED is essentially equivalent to APD; and for very long time periods, the EED will result in emplacement spacings similar to those for AML (similar, but not the same). The selection of a preferred deposition period is a function of the design goals in question, such as: to engineer a thermal environment that facilitates emplacement (and retrieval) operations, or to engineer a long-term thermal environment that will facilitate waste isolation. In consideration of these differing design goals, three different time integration periods have been considered: 100, 1000, 10,000, and 100,000 years. The 1000 year time period could be considered a compromise between short and long-term effects, and will be developed more extensively here.

The first step in defining a particular EED emplacement strategy is to specify the desired thermal loading goal in GJ/m^2 (giga-joules per meter squared). Using the average PWR and BWR assembly information listed in Table 7.5-3 (derived from Attachment XXVII), the total repository heat due to commercial SNF (from waste stream "Case 1") integrated over 1000 years is 309,408 TJ (tera-

joules). The integrated heat is calculated from the table of heat output (in Attachment XXVII) by performing a summation of the heat produced (average heat rate over each time increment multiplied by the time increment) over each of the time increments listed. For example, the integrated heat for the average PWR assembly for 0.01 years is 0.15 GJ [= (476.02+475.88) ÷ 2 × 0.01 × 365.25 × 24 × 3600 ÷ 10^9]. Using the 1000 year integrated heat total and the total emplaced mass of SNF from Table 7.5-3, an equivalent repository loading (in terms of EED) can be calculated that would represent the same net density of SNF called for by the assumed repository mass loadings of 83, 85 and 100 MTU/acre (consistent with CDA Assumption Key 019, Ref. 5.9).

Table 7.5-3. Characteristics of Average SNF for Waste Stream Case 1

Total Repository Waste Stream Characteristic	PWR SNF	BWR SNF
Average Assembly Mass (Attachment XXVII)	0.432 MTU	0.177 MTU
Average Initial Assembly Heat (Attachment XXVII)	476.02 watts	174.51 watts
Number of Assemblies Emplaced (Attachment XXVII)	94,847 assemblies	124,269 assemblies
1000 year Integrated Heat per Average Assembly	2172.61 GJ	831.60 GJ
1000 year Integrated Heat for All Commercial SNF	309,408 TJ (tera-joules)	
Total Mass Emplaced for All Commercial SNF	63,003.69 MTU (p. 5, Attachment LXVI)	
1000 year EED Loading Equivalent to 83 MTU/acre of Commercial SNF	100.72 GJ/m^2 (Nominal 101 GJ/m^2)	
1000 year EED Loading Equivalent to 85 MTU/acre of Commercial SNF	103.15 GJ/m^2 (Nominal 103 GJ/m^2)	
1000 year EED Loading Equivalent to 100 MTU/acre of Commercial SNF	121.35 GJ/m^2 (Nominal 121 GJ/m^2)	

The second step in defining a particular EED emplacement strategy is to determine the integrated heat output for each of the WPs to be emplaced. Table 7.5-4 provides the average integrated energy output over 100, 1000, 10,000, and 100,000 years for each of the eight commercial SNF WP design types. The integrated heat is calculated from the table of heat output (in Attachment XXXIX) by performing a summation of the heat produced over each of the time increments listed. Example nominal spacings (for the three EED loadings of Table 7.5-3) for each of the SNF WP design types are provided in Table 7.5-5. These example spacings are, however, only based upon the average heat output for each WP and do not consider the significant variability in heat output expected. Table 7.5-4 also provides the integrated energy output over 100, 1000, and 10,000 years for each of the WP design types loaded with the recommended design basis SNF and for the 4 canister capacity DHLW WP. The integrated heat for the WPs with design basis SNF is the limiting case (highest

possible) for each WP design type; however, it does not "represent" any portion of the waste stream. This definition of the "hottest WP" is necessary for design because every WP must be shown to meet thermal goals and requirements (using design basis SNF characteristics).

Table 7.5-4. Integrated WP Heat Output for Waste Stream Case 1

WP Types:	ID:	Average Heat per WP Integrated Over:			
		100 years	1000 years	10,000 years	100,000 years
21 PWR - no absorber base thermal & criticality	1	16,796 GJ	49,784 GJ	117,686 GJ	240,085 GJ
21 PWR - absorber plates criticality option 1	2	14,345 GJ	42,133 GJ	99,711 GJ	206,205 GJ
21 PWR - absorber rods (no plates) criticality option 2	3	4,721 GJ	15,350 GJ	43,374 GJ	103,118 GJ
12 PWR - no absorber thermal option 1	4	15,634 GJ	38,721 GJ	86,003 GJ	169,591 GJ
12 PWR - absorber plates base South Texas long WP	5	15,664 GJ	41,586 GJ	90,455 GJ	177,995 GJ
44 BWR - no absorber base thermal & criticality	6	17,561 GJ	48,206 GJ	105,615 GJ	207,637 GJ
44 BWR - absorber plates criticality option 1	7	10,602 GJ	33,072 GJ	76,744 GJ	156,856 GJ
24 BWR - thick absorber plates thermal option 1, criticality option 2	8	1,361 GJ	3,979 GJ	12,681 GJ	33,578 GJ
21 PWR with Design Basis SNF		27,498 GJ	70,456 GJ	163,629 GJ	326,593 GJ
12 PWR with Design Basis SNF		20,053 GJ	45,598 GJ	98,982 GJ	192,151 GJ
12 South Texas Design Basis SNF		22,598 GJ	52,386 GJ	114,951 GJ	224,175 GJ
44 BWR with Design Basis SNF		25,312 GJ	64,184 GJ	136,704 GJ	264,706 GJ
24 BWR with Design Basis SNF		15,035 GJ	36,511 GJ	76,103 GJ	145,964 GJ
5 DHLW WP - Hanford		3,589 GJ	5,308 GJ	5,746 GJ	6,362 GJ
5 DHLW WP - Savannah River		3,817 GJ	4,912 GJ	5,821 GJ	8,590 GJ
5 DHLW WP - West Valley		2,039 GJ	2,797 GJ	3,479 GJ	4,905 GJ

Table 7.5-5 provides example WP spacings for average and design basis WPs for nominal EED loadings of 101, 103, and 121 GJ/m^2 (equivalent to 83, 85, and 100 MTU/acre). While the WP spacings listed in Table 7.5-5 are not intended to be the final determination of the emplacement layout, the spacings do illustrate some potential problems with the EED method. Specifically, some of the cooler WPs will receive drift length allocations that are less than their physical length. Since it would not be possible to deviate from the EED spacings without violating the basic thermal strategy principles, some WP sequencing control and management would be required such that a WP with a space deficiency would always be placed adjacent to higher heat WPs with additional physical space. The minimum additional space to be "borrowed" from and adjacent WP would be based only upon the minimum space necessary to perform the emplacement operation (room for the emplacement gantry, etc.). Minimum spacing requirement due to peak near-field temperatures (p. 6.2-41, Ref. 5.6) would likely not be an issue because the heat deposition density is (by definition) regulated by the EED emplacement layout. That is, high heat WPs would already be given a larger emplacement WP spacing due to their integrated heat output.

An ideal EED emplacement methodology would provide a unique WP spacing for each individual WP based on that package's integrated heat. To implement this strategy, the characteristics of each WP must be known in advance such that a unique WP spacing could be calculated for each of the (roughly) 10,000 WPs. The detailed information needed to pre-determine the characteristics of each individual WP to be emplaced (based on assumptions and projections) was not developed in this design analysis; however, it could be developed with further analysis for a single given waste stream projection. For the AML emplacement strategy, it was shown (for simplicity in design) that the WP spacings could be determined using the average characteristics for each WP design type instead of the characteristics of each individual WP. This results in a set WP spacing for each WP type, given the mass loading strategy. However, a fixed WP spacing is not consistent with the goals of an EED emplacement because the basis of the strategy is the uniform deposition of heat across the repository horizon. The EED method necessitates the use of an individual WP spacing for every single WP to emplaced in the repository.

Table 7.5-5. Example EED WP Spacing for Waste Stream Case 1

WP Types:	ID:	Nominal center-to-center WP Spacing for 1000 year EED of:		
		101 GJ/m² with 22.5 m Drift Spacing	103 GJ/m² with 28.0 m Drift Spacing	121 GJ/m² with 22.5 m Drift Spacing
21 PWR - no absorber base thermal & criticality	1	21.907 m	17.262 m	18.286 m
21 PWR - absorber plates criticality option 1	2	18.540 m	14.609 m	15.476 m
21 PWR - absorber rods (no plates) criticality option 2	3	6.755 m	5.322 m	5.638 m
12 PWR - no absorber thermal option 1	4	17.039 m	13.426 m	14.223 m
12 PWR - absorber plates base South Texas long WP	5	18.300 m	14.420 m	15.275 m
44 BWR - no absorber base thermal & criticality	6	21.213 m	16.715 m	17.707 m
44 BWR - absorber plates criticality option 1	7	14.553 m	11.467 m	12.148 m
24 BWR - thick absorber plates thermal option 1, criticality option 2	8	1.751 m	1.380 m	1.462 m
21 PWR with Design Basis SNF		31.004 m	24.430 m	25.879 m
12 PWR with Design Basis SNF		20.065 m	15.811 m	16.749 m
12 South Texas Design Basis SNF		23.052 m	18.164 m	19.242 m
44 BWR with Design Basis SNF		28.244 m	22.255 m	23.575 m
24 BWR with Design Basis SNF		16.066 m	12.660 m	13.411 m
5 DHLW WP - Hanford		2.336 m *	1.840 m *	1.950 m *
5 DHLW WP - Savannah River		2.161 m *	1.703 m *	1.804 m *
5 DHLW WP - West Valley		1.231 m *	0.970 m *	1.027 m *

* Consistent with the strategy for AML, the DHLW WPs may not be allocated an individual spacing; they would simply be placed between large SNF WPs where possible.

7.5.4 Thermal Loading Approach

The sensitivity of waste isolation performance to the complexity of the WP spacing algorithm is currently unknown. Therefore, at this time, the relatively simple AML approach (using a limited group of WP AML categories) is recommended. A viable thermal loading strategy for waste isolation must be articulated and confirming calculations of near-field thermal performance must be performed before the EED emplacement method can replace the current emplacement method based upon waste mass. Compared to the relatively simple emplacement formula based on nominal waste package mass, the more complex variable spacing of the EED method will require a demonstrated improvement in waste isolation performance. It is recommended that, for VA design, the average WP characteristics be used to develop mass-based repository emplacement layouts as described by the examples in Table 7.5-2. (Note that Table 7.5-2 does not select the thermal loading strategy or the specific WP spacing; rather, it provides a summary of WP design characteristics and design bases for use in developing emplacement designs.) To demonstrate compliance with design requirements, emplacement spacings based on waste mass should be robust and have sufficient margin to accommodate the WP heat variability. It is not clear that unique AML WP spacings rather than WP spacings based upon AML averages (one nominal WP spacing for each WP design type) would lower near-field temperature variability or improve waste isolation performance.

While AML is recommended for VA design, calculations should be performed to evaluate and develop the EED methodology due to its potential to support the constructive use of heat to aid waste isolation. Sufficient integrated heat information is provided here to perform comparisons of emplacement layout performance and thermal loading strategy; however, further calculations of waste receipt and statistics related to individual WP heat outputs and characteristics must be developed to fully explore the EED performance.

8. Conclusions

The purpose of this analysis is to determine the design basis commercial SNF heat output to be used in subsequent thermal analyses of the WP and its near field environment. This analysis has also determined the average SNF heat output (as a function of the SNF waste stream) for each potential WP design listed in Table 4.1-1. Specifically, the four main objectives met here are to determine: 1) the appropriate design basis fuel characteristics to assume for WP thermal analysis, 2) the average fuel characteristics for each WP design based on reasonable design basis waste streams, 3) the nominal characteristics of canistered HLW glass, and 4) the appropriate implementation of these waste form characteristics into assumptions for thermal loading of the potential repository at Yucca Mountain. This information will provide the base assumptions used to develop thermal analyses of the waste package, its support structures, and the waste forms. The following are the recommendations for average and design basis SNF and DHLW characteristics resulting from this design analysis.

Due to the unqualified/unconfirmed input data used in this analysis, the output and conclusions from this analysis can not be used as input into documents supporting procurement, fabrication, or construction unless they are controlled and tracked as TBV or TBD in accordance with NLP-3-15 or other appropriate procedures.

8.1 Design Basis Fuel Characteristics

8.1.1 PWR SNF

The B&W 15x15 Mark B4 PWR assembly (see the discussion in Section 7.2 and the dimensions in Table 4.1-2) was selected as the design basis assembly configuration for PWR SNF (excluding South Texas). The design basis PWR uranium mass loading is 464 kg of initial uranium per assembly. The design basis PWR assembly has a burnup of 60,000 MWd/MTU and an initial enrichment of 4.73%. For the three 21 PWR WP designs, the initial single assembly heat limit is 850 watts (represented by an assembly age of 19.8 years). The design basis PWR assembly heat output as a function of time for those 21 PWR WPs is given in Attachment IX. For the 12 PWR high heat WP design, the initial single assembly heat limit is 1500 watts (represented by an assembly age of 6.0 years). The design basis PWR assembly heat output as a function of time for that WP is given in Attachment XV. For thermal analyses that utilize a smeared heat source homogeneous SNF assembly, the design basis homogeneous assembly density is given by the mass of the assembly (773.4 kg) divided by the WP basket opening size, the homogeneous conductivity is given by Reference 5.21, and the homogeneous specific heat is 274 J/kg·K. An axial power peaking factor of 1.25 should be used for all PWR assemblies.

Of twelve potential commercial SNF waste stream scenarios, "Case 1" was selected in the Throughput Study as a recommended repository design reference (Section 5.6.1, Ref. 5.20). Average

PWR assembly characteristics (for all PWRs including South Texas) were developed based upon the recommended waste stream case. The average PWR assembly heat output as a function of time for waste stream "Case 1" is given in Attachment XXVII. The average PWR assembly has an average age of 26.1 years, burnup of 39,500 MWd/MTU, initial enrichment of 3.70%, and initial uranium mass of 0.432 MTU/assembly (values from Table 7.3-5 rounded to 3 significant figures).

8.1.2 South Texas SNF

The Westinghouse 17x17 South Texas PWR assembly (see dimensions in Table 4.1-3) is the design basis assembly configuration for South Texas PWR SNF. The design basis South Texas uranium mass loading is 544 kg of initial uranium per assembly. The design basis South Texas assembly has a burnup of 60,000 MWd/MTU and an initial enrichment of 4.73%. For the 12 PWR South Texas WP design, the initial single assembly heat limit is 1500 watts (represented by an assembly age of 7.8 years). The design basis South Texas assembly heat output as a function of time for that WP is given in Attachment XVI. For thermal analyses that utilize a smeared heat source homogeneous SNF assembly, the design basis homogeneous assembly density is given by the mass of the assembly (882.2 kg) divided by the WP basket opening size, the homogeneous conductivity is assumed to be the same as that for other PWR assemblies as given in Reference 5.21, and the homogeneous specific heat is 272 J/kg·K. An axial power peaking factor of 1.25 should be used for all PWR assemblies, including South Texas.

8.1.3 BWR SNF

The GE-5 8x8 BWR assembly (see dimension in Table 4.1-4) was selected as the design basis assembly configuration for BWR SNF. The design basis PWR uranium mass loading is 200 kg of initial uranium per assembly. The design basis BWR assembly has a burnup of 50,000 MWd/MTU and an initial enrichment of 3.74%. For the two 44 BWR WP designs, the initial single assembly heat limit is 400 watts (represented by an assembly age of 11.0 years). The design basis BWR assembly heat output as a function of time for the 44 BWR WPs is given in Attachment XXI. For the 24 BWR WP design, the initial single assembly heat limit is 520 watts (represented by an assembly age of 6.4 years). The design basis BWR assembly heat output as a function of time for that WP is given in Attachment XXVI. For thermal analyses that utilize a smeared heat source homogeneous SNF assembly, the design basis homogeneous assembly density is given by the mass of the assembly (328.4 kg) divided by the WP basket opening size, the homogeneous conductivity is given by Reference 5.21, and the homogeneous specific heat is 273 J/kg·K. An axial power peaking factor of 1.40 should be used for all BWR assemblies.

The average BWR assembly heat output as a function of time for waste stream "Case 1" is given in Attachment XXVII. The average BWR assembly has an average age, burnup, enrichment, and initial uranium mass of 27.0 years, 32,400 MWd/MTU, 3.02%, and 0.177 MTU/assembly, respectively (values from Table 7.3-5 rounded to 3 significant figures).

8.2 Average Waste Package Characteristics

Average assembly characteristics were developed for each of the eight waste package design options based upon the recommended waste stream "Case 1". Tables of average assembly heat production (for each WP type) as a function of time are given in Attachment XXXIX and can be used to calculate average (or nominal) heat outputs for each WP design (heat is reported on a per-assembly basis in the attachments). The tables were created by averaging the predicted heat decay curve (normalized to time of emplacement) of the assemblies loaded into each WP type.

Calculated average WP statistics for waste stream "Case 1" are also provided in Table 8-1 (also see Attachment LXVI). The coverage range indicates the number of waste packages of each design type and the percentage of assemblies (for PWRs and BWRs) captured by that design type. Table 8-1 also provides the average uranium mass loading (based on the initial uranium mass loading of the assemblies) for each WP type. The average mass provides a method for determining the nominal (or average) WP emplacement spacing in a repository design where loading is based on the WP mass (MTU/acre for example).

Table 8-1. WP Design Coverage for Waste Stream Case 1

WP Types:	ID:	Coverage Range		Average MTU/WP	Average Initial WP Heat Output	Design Basis Initial WP Heat Output
		# of WPs	% of SNF*			
21 PWR - No Absorber (base thermal & criticality)	1	1444	31.96%	8.988 MTU	10.272 kW	17.850 kW
21 PWR - Absorber Plates (criticality option 1)	2	2641	58.47%	9.051 MTU	9.120 kW	17.850 kW
21 PWR - Absorber Rods (No Plates) (criticality option 2)	3	120	2.66%	8.148 MTU	2.905 kW	17.850 kW
12 PWR - No Absorber (thermal option 1)	4	390	4.93%	5.436 MTU	11.231 kW	18.000 kW
12 PWR - Long, Absorber Plates (base South Texas long WP)	5	150	1.90%	6.468 MTU	10.477 kW	18.000 kW
44 BWR - No Absorber (base thermal & criticality)	6	696	24.61%	7.656 MTU	11.625 kW	17.600 kW
44 BWR - Absorber Plates (criticality option 1)	7	2107	74.59%	7.876 MTU	6.440 kW	17.600 kW
24 BWR - Thick Absorber Plates (thermal option 1, criticality option 2)	8	42	0.80%	3.960 MTU	0.933 kW	12.480 kW

* Percent of PWR or BWR waste stream accommodated.

Other average SNF assembly characteristics, such as average age, burnup, and enrichment, are summarized in Table 7.3-5 which lists the average assembly characteristics for each of the commercial SNF WP design types. It is important to note that average assembly characteristics can be misleading because the heat of the average assembly type is not the same as the average assembly heat, and variability in the waste stream precludes the definition of a meaningful "nominal" assembly type.

Some of the assemblies projected to be delivered to the first repository in waste stream "Case 1" were found to exceed the WP loading constraints and were not initially placed into one of the eight commercial SNF WP designs. (This is why the percentages for PWRs in Table 8-1 do not add up to exactly 100%.) It is estimated that by slightly modifying the loading constraints and/or aging a few assemblies, all of the SNF could be accommodated. Eight of the unbinned PWR assemblies would result in one additional 21 PWR with control rods WP if the $k_{infinity}$ limit for that package were raised by 0.01; and 73 unbinned PWR assemblies would result in four additional 21 PWR with absorber plates WPs if those assemblies could be cooled (aged) for several years. Impacts to the Surface Facility design due to SNF aging are not characterized here. Based on the total number of WPs, it can be concluded that these five additional waste packages will not measurably impact the average heat output characteristics of Attachment XXXIX.

Also, the WP totals in Table 8-1 represent the number of WPs emplaced when partially filled WPs left over at the end of each year of emplacement are completed and emplaced in the next year. Table 7.3-7 lists the number of WPs used when partially filled WPs are emplaced at the end of each year instead (consistent with CDA Key 003). The difference, 77 additional WPs, will not significantly impact calculations of average WP heat output

8.3 Canistered HLW Glass Characteristics

Currently, there are four sites that will manufacture high-level waste glass: Hanford, Savannah River Plant, West Valley, and Idaho National Environmental and Engineering Laboratory. The physical dimensions of the Savannah River pour canister are assumed to represent a typical high-level waste glass waste form for the potential repository at Yucca Mountain. While detailed information about the probable glass wastes to be produced at the other generating sites is currently being collected, the Savannah River canister is the best documented design at this time. Typical dimensions for the Savannah River canister are provided in Table 4.1-5. The density of the glass waste form is assumed to be 2688.6 kg/m^3 based on the nominal glass weight and volume and the conductivity is 1.1 W/m·K. The Pyrex glass specific heat of 835 J/kg·K and emissivity of 0.81 are assumed to be applicable to the borosilicate glass waste form. Attachments LI, LII, LIII are representative of the heat output of Hanford, Savannah River, and West Valley canisters. These decay tables are considered somewhat conservative as the aging time between glass production and actual emplacement in the repository has been neglected.

8.4 Thermal Loading

There are three emplacement strategies for repository thermal loading: Areal Power Density (APD, where WPs are spaced according to their heat output at the time of emplacement), Areal Mass Loading (AML, where WPs are spaced according to their heavy metal mass content), and Equivalent Energy Density (EED, where WPs are spaced according to their integrated heat output over a specified time period).

The sensitivity of waste isolation performance to the complexity of the WP spacing algorithm is currently unknown. Therefore, at this time, the relatively simple AML approach (using a limited group of WP AML categories) is recommended. Consistent with previously specified AML strategies (Ref. 5.38), DHLW WPs would be placed between the large (21 PWR or 44 BWR) WPs with no additional individual WP spacing allocation.

A viable thermal loading strategy for waste isolation must be articulated and confirming calculations of near-field thermal performance must be performed before the EED emplacement method can replace the current emplacement method which is based upon waste mass. Compared to the relatively simple emplacement formula based on nominal waste package mass, the more complex variable spacing of the EED method will require a demonstrated improvement in waste isolation performance. It is recommended that, for VA design, the average WP characteristics be used to develop mass-based repository emplacement layouts as described by the examples in Table 7.5-2. (Note that Table 7.5-2 does not select the thermal loading strategy or the specific WP spacing; rather, it provides a summary of WP design characteristics and design bases for use in developing emplacement design.) To demonstrate compliance with design requirements, emplacement spacings based on waste mass should be robust and have sufficient margin to accommodate the WP heat variability. It is not clear that unique AML WP spacings rather than WP spacings based upon AML averages (one nominal WP spacing for each WP design type) would lower near-field temperature variability or improve waste isolation performance.

While AML is recommended for VA design, calculations should be performed to evaluate and develop the EED methodology due to its potential to support the constructive use of heat to aid waste isolation. Sufficient integrated heat information is provided here to perform comparisons of emplacement layout performance and thermal loading strategy; however, further calculations of waste receipt and statistics related to individual WP heat outputs and characteristics must be developed to fully explore the EED performance.

8.4 Thermal Loading

There are three emplacement strategies for repository thermal loading: Areal Power Density (APD, where WPs are spaced according to their heat output at the time of emplacement), Areal Mass Loading (AML, where WPs are spaced according to their heavy metal mass content), and Equivalent Energy Density (EED, where WPs are spaced according to their integrated heat output over a specified time period).

The sensitivity of waste isolation performance to the complexity of the WP spacing algorithm is currently unknown. Therefore, at this time, the relatively simple AML approach (using a limited group of WP AML categories) is recommended. Consistent with previously specified AML strategies (Ref. 5.38), DHLW WPs would be placed between the large (21 PWR or 44 BWR) WPs with no additional individual WP spacing allocation.

A viable thermal loading strategy for waste isolation must be articulated and confirming calculations of near-field thermal performance must be performed before the EED emplacement method can replace the current emplacement method which is based upon waste mass. Compared to the relatively simple emplacement formula based on nominal waste package mass, the more complex variable spacing of the EED method will require a demonstrated improvement in waste isolation performance. It is recommended that, for VA design, the average WP characteristics be used to develop mass-based repository emplacement layouts as described by the examples in Table 7.5-2. (Note that Table 7.5-2 does not select the thermal loading strategy or the specific WP spacing; rather, it provides a summary of WP design characteristics and design bases for use in developing emplacement designs.) To demonstrate compliance with design requirements, emplacement spacings based on waste mass should be robust and have sufficient margin to accommodate the WP heat variability. It is not clear that unique AML WP spacings rather than WP spacings based upon AML averages (one nominal WP spacing for each WP design type) would lower near-field temperature variability or improve waste isolation performance.

While AML is recommended for VA design, calculations should be performed to evaluate and develop the EED methodology due to its potential to support the constructive use of heat to aid waste isolation. Sufficient integrated heat information is provided here to perform comparisons of emplacement layout performance and thermal loading strategy; however, further calculations of waste receipt and statistics related to individual WP heat outputs and characteristics must be developed to fully explore the EED performance.

9. Attachments

Attachments to this design analysis are summarized in Table 9-1. Each attachment is identified by its specific number, file name, date, and number of pages.

Table 9-1. List of Attachments

Attachment Number	Title / Description	File Name	Date	Number of Pages
I	PHIA00D Program Source Code Listing	phia00d.cpp	08/12/97	3
II	WPBIN00D Program Source Code Listing	wpbin00d.cpp	08/12/97	8
III	GETHEAT Database File	heatdat.dat	08/08/94	6
IV	PHIA00D Output, PWR Heat (850 W, 10 GWd/MTU)	pwr850a.dat	08/12/97	1
V	PHIA00D Output, PWR Heat (850 W, 20 GWd/MTU)	pwr850b.dat	08/12/97	1
VI	PHIA00D Output, PWR Heat (850 W, 30 GWd/MTU)	pwr850c.dat	08/12/97	1
VII	PHIA00D Output, PWR Heat (850 W, 40 GWd/MTU)	pwr850d.dat	08/12/97	1
VIII	PHIA00D Output, PWR Heat (850 W, 50 GWd/MTU)	pwr850e.dat	08/12/97	1
IX	PHIA00D Output, PWR Heat (850 W, 60 GWd/MTU)	pwr850f.dat	08/12/97	1
X	PHIA00D Output, PWR Heat (1500 W, 10 GWd/MTU)	pwr1500a.dat	08/12/97	1
XI	PHIA00D Output, PWR Heat (1500 W, 20 GWd/MTU)	pwr1500b.dat	08/12/97	1
XII	PHIA00D Output, PWR Heat (1500 W, 30 GWd/MTU)	pwr1500c.dat	08/12/97	1
XIII	PHIA00D Output, PWR Heat (1500 W, 40 GWd/MTU)	pwr1500d.dat	08/12/97	1
XIV	PHIA00D Output, PWR Heat (1500 W, 50 GWd/MTU)	pwr1500e.dat	08/12/97	1
XV	PHIA00D Output, PWR Heat (1500 W, 60 GWd/MTU)	pwr1500f.dat	08/12/97	1
XVI	PHIA00D Output, STx Heat (1500 W, 60 GWd/MTU)	stx1500f.dat	08/12/97	1
XVII	PHIA00D Output, BWR Heat (400 W, 10 GWd/MTU)	bwr400a.dat	08/12/97	1
XVIII	PHIA00D Output, BWR Heat (400 W, 20 GWd/MTU)	bwr400b.dat	08/12/97	1
XIX	PHIA00D Output, BWR Heat (400 W, 30 GWd/MTU)	bwr400c.dat	08/12/97	1
XX	PHIA00D Output, BWR Heat (400 W, 40 GWd/MTU)	bwr400d.dat	08/12/97	1
XXI	PHIA00D Output, BWR Heat (400 W, 50 GWd/MTU)	bwr400e.dat	08/12/97	1
XXII	PHIA00D Output, BWR Heat (520 W, 10 GWd/MTU)	bwr520a.dat	08/12/97	1
XXIII	PHIA00D Output, BWR Heat (520 W, 20 GWd/MTU)	bwr520b.dat	08/12/97	1

XXIV	PHIA00D Output, BWR Heat (520 W, 30 GWd/MTU)	bwr520c.dat	08/12/97	1
XXV	PHIA00D Output, BWR Heat (520 W, 40 GWd/MTU)	bwr520d.dat	08/12/97	1
XXVI	PHIA00D Output, BWR Heat (520 W, 50 GWd/MTU)	bwr520e.dat	08/12/97	1
XXVII	WPBIN00D Output, Ave. PWR & BWR Heat (Case 1)	case1.dat	08/12/97	2
XXVIII	WPBIN00D Output, Ave. PWR & BWR Heat (Case 2)	case2.dat	08/12/97	2
XXIX	WPBIN00D Output, Ave. PWR & BWR Heat (Case 3)	case3.dat	08/12/97	2
XXX	WPBIN00D Output, Ave. PWR & BWR Heat (Case 4)	case4.dat	08/12/97	2
XXXI	WPBIN00D Output, Ave. PWR & BWR Heat (Case 5)	case5.dat	08/12/97	2
XXXII	WPBIN00D Output, Ave. PWR & BWR Heat (Case 6)	case6.dat	08/12/97	2
XXXIII	WPBIN00D Output, Ave. PWR & BWR Heat (Case 7)	case7.dat	08/12/97	2
XXXIV	WPBIN00D Output, Ave. PWR & BWR Heat (Case 8)	case8.dat	08/12/97	2
XXXV	WPBIN00D Output, Ave. PWR & BWR Heat (Case 9)	case9.dat	08/12/97	2
XXXVI	WPBIN00D Output, Ave. PWR & BWR Heat (Case 10)	case10.dat	08/12/97	2
XXXVII	WPBIN00D Output, Ave. PWR & BWR Heat (Case 11)	case11.dat	08/12/97	2
XXXVIII	WPBIN00D Output, Ave. PWR & BWR Heat (Case 12)	case12.dat	08/12/97	2
XXXIX	WPBIN00D Output, Ave. Heat for Each WP (Case 1)	finalw1.dat	08/12/97	8
XL	WPBIN00D Output, Ave. Heat for Each WP (Case 2)	finalw2.dat	08/12/97	8
XLI	WPBIN00D Output, Ave. Heat for Each WP (Case 3)	finalw3.dat	08/12/97	8
XLII	WPBIN00D Output, Ave. Heat for Each WP (Case 4)	finalw4.dat	08/12/97	8
XLIII	WPBIN00D Output, Ave. Heat for Each WP (Case 5)	finalw5.dat	08/12/97	8
XLIV	WPBIN00D Output, Ave. Heat for Each WP (Case 6)	finalw6.dat	08/12/97	8
XLV	WPBIN00D Output, Ave. Heat for Each WP (Case 7)	finalw7.dat	08/12/97	8
XLVI	WPBIN00D Output, Ave. Heat for Each WP (Case 8)	finalw8.dat	08/12/97	8
XLVII	WPBIN00D Output, Ave. Heat for Each WP (Case 9)	finalw9.dat	08/12/97	8
XLVIII	WPBIN00D Output, Ave. Heat for Each WP (Case 10)	finalw10.dat	08/12/97	8
XLIX	WPBIN00D Output, Ave. Heat for Each WP (Case 11)	finalw11.dat	08/12/97	8
L	WPBIN00D Output, Ave. Heat for Each WP (Case 12)	finalw12.dat	08/12/97	8
LI	HLW Glass Heat, Hanford (from Att. VI of Ref. 5.31)	hangls2.dat	09/29/97	1
LII	HLW Glass Heat, Sav. River (from Att. III of Ref. 5.31)	srpgls2.dat	09/29/97	1
LIII	HLW Glass Heat, West Valley (from Att. IX of Ref. 5.31)	wvygls2.dat	09/29/97	1

LIV	WPBIN00D Input & Output, Assembly Sorting (Case 1)	case1.all	08/12/97	12
LV	WPBIN00D Input & Output, Assembly Sorting (Case 2)	case2.all	08/12/97	12
LVI	WPBIN00D Input & Output, Assembly Sorting (Case 3)	case3.all	08/12/97	12
LVII	WPBIN00D Input & Output, Assembly Sorting (Case 4)	case4.all	08/12/97	12
LVIII	WPBIN00D Input & Output, Assembly Sorting (Case 5)	case5.all	08/12/97	12
LIX	WPBIN00D Input & Output, Assembly Sorting (Case 6)	case6.all	08/12/97	12
LX	WPBIN00D Input & Output, Assembly Sorting (Case 7)	case7.all	08/12/97	12
LXI	WPBIN00D Input & Output, Assembly Sorting (Case 8)	case8.all	08/12/97	12
LXII	WPBIN00D Input & Output, Assembly Sorting (Case 9)	case9.all	08/12/97	37
LXIII	WPBIN00D Input & Output, Assembly Sorting (Case 10)	case10.all	08/12/97	13
LXIV	WPBIN00D Input & Output, Assembly Sorting (Case 11)	case11.all	08/12/97	37
LXV	WPBIN00D Input & Output, Assembly Sorting (Case 12)	case12.all	08/12/97	13
LXVI	WPBIN00D Input & Output, WP Loading (Case 1)	finalw1.all	08/12/97	8
LXVII	WPBIN00D Input & Output, WP Loading (Case 2)	finalw2.all	08/12/97	9
LXVIII	WPBIN00D Input & Output, WP Loading (Case 3)	finalw3.all	08/12/97	8
LXIX	WPBIN00D Input & Output, WP Loading (Case 4)	finalw4.all	08/12/97	8
LXX	WPBIN00D Input & Output, WP Loading (Case 5)	finalw5.all	08/12/97	9
LXXI	WPBIN00D Input & Output, WP Loading (Case 6)	finalw6.all	08/12/97	8
LXXII	WPBIN00D Input & Output, WP Loading (Case 7)	finalw7.all	08/12/97	8
LXXIII	WPBIN00D Input & Output, WP Loading (Case 8)	finalw8.all	08/12/97	8
LXXIV	WPBIN00D Input & Output, WP Loading (Case 9)	finalw9.all	08/12/97	38
LXXV	WPBIN00D Input & Output, WP Loading (Case 10)	finalw10.all	08/12/97	11
LXXVI	WPBIN00D Input & Output, WP Loading (Case 11)	finalw11.all	08/12/97	37
LXXVII	WPBIN00D Input & Output, WP Loading (Case 12)	finalw12.all	08/12/97	11

```
/*phia.cpp Package Heat Input to ANSYS; now using the official heat
 * subroutines.  Now going to 900,000 yrs                                  */
#include <conio.h>
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <float.h>
#include <string.h>
#include <ctype.h>
#include <time.h>
#include <graph.h>
#define MAIN
#include "heathdrs.h"

long int count;
int bmatch=0;
//Heat h;      Used only for quickwin
float getheat(float,float,float,int),icheck(float,float,float,int);
void buildref();
float refburnup[7][2],assay[7][2][3],getfloat(char*,int,int);

void main()
{long int i,j,k,years,mintime,maxtime=900000,
   upper,ansyssteps=0;
short type;
float x,lastheat,burnup,mtupassy,old,fnew,age,a,time,eps=.00001,
     times[]={.1, 1.0, 10.0, 100.0, 1000.0,10000.0,100000.0, 900000.0},
     dtimes[]={.01, .05, .5, 5, 50, 500,5000,50000};
unsigned int num,total,cycle;
char buf[80],c,datestr[15],numstr[3],binstr[]="ASSY";
FILE *fout,*ferr;
buildref();
ferr=fopen("junk.e","w");
_clearscreen(_GCLEARSCREEN);
printf("*****************************************************************\n");
printf("**            Package Heat Input to ANSYS (PHIA)               **\n");
printf("** Enter the following parameters, separated by blanks, CR at end. **\n");
printf("**                                                               **\n");
printf("**     Age at emplacement in years (must be greater than 1)      **\n");
printf("**     Burnup  (MWD/MTU), 10000<=burnup<=60000 for PWR           **\n");
printf("**                        7500<=burnup<=50000 for BWR            **\n");
printf("**     Enrichment in percent (zero if you wish to use average)   **\n");
printf("**     Fuel Type         (BWR=b, PWR=p)                          **\n");
printf("**     Mass of fuel per assembly (MTU/assy)                      **\n");
printf("**                                                               **\n");
printf("** Typical example:  5  35000  3.75  p  .43                     **\n");
printf("*****************************************************************\n");
num=scanf("%f %f %f %c %f",&age,&burnup,&a,&c,&mtupassy);
type=(tolower(c)=='b')?0:1;
x=icheck(age,burnup,a,type);
printf("\nEnter name of file for output\n");
scanf("%s",buf);
while((fout=fopen(buf,"w"))==NULL)
  {printf("Please enter a valid filename.\n");
  scanf("%s",buf);};
_strdate(datestr);
fprintf(fout,"/COM, ");
fprintf(fout,"*****************************************************************\n");
fprintf(fout,"/COM, ");
fprintf(fout,"** History of SNF Assembly Heat Generation Rates          **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"**                                                         **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"**    Executable File Name:   PHIA00D.EXE                  **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"**    Output File Name:       %-12s%22s**\n",buf," ");
fprintf(fout,"/COM, ");
fprintf(fout,"**    Execution Date:         %-12s%22s**\n",datestr," ");
```

```
fprintf(fout,"/COM, ");
fprintf(fout,"**    Start Age (years):      %-12.1f%22s**\n",age," ");
fprintf(fout,"/COM, ");
fprintf(fout,"**    Decay Period (years):   %-12ld%22s**\n",maxtime," ");
if(a==0)
  {fprintf(fout,"/COM, ");
  fprintf(fout,"**    Default average enrichment for the burnup specified       **\n");}
fprintf(fout,"/COM, ");
fprintf(fout,"**    Enrichment (percent):   %-12.2f%22s**\n",
           (a>0)?a:x," ");
fprintf(fout,"/COM, ");
fprintf(fout,"**    Burnup (MWd/MTU):       %-12.0f%22s**\n",burnup," ");
fprintf(fout,"/COM, ");
fprintf(fout,"**    Assembly Type:          %-12s%22s**\n",
                (type==0)?"BWR":"PWR"," ");
fprintf(fout,"/COM, ");
fprintf(fout,"**    SNF U Mass (MTU/assy):  %-12.3f%22s**\n",mtupassy," ");
fprintf(fout,"/COM, ");
fprintf(fout,"**                                                          **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"** ASSY(#,1) is the SNF assembly heat in Watts.             **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"** ASSY(#,0) is the time post emplacement in years.         **\n");
fprintf(fout,"/COM, ");
fprintf(fout,"*************************************************************\n");
time=0;
cycle=0;
while(time<maxtime)
  {ansyssteps++;
  if(time>=times[cycle]-eps)cycle++;
  time+=dtimes[cycle];}
fprintf(fout,"*SET,%s,\n",binstr);
fprintf(fout,"*DIM,%s,TABLE,%ld,1,\n",binstr,ansyssteps+1);
time=.000001;
fprintf(fout,"ASSY( 1,1)=%9.2f,",
              mtupassy*h.GetHeat(age+time,type,burnup,a));
num=1;
total=1;
cycle=0;
time=0;
while(time<maxtime)
  {total++;
  if(time>=times[cycle]-eps)cycle++;
  time+=dtimes[cycle];
  x=mtupassy*h.GetHeat(age+time,type,burnup,a);
  if(x<1)fprintf(fout,"%9.3f,",x);
  else fprintf(fout,"%9.2f,",x);
  if(num<5)num++;
  else
    {if(time<maxtime)fprintf(fout,"\nASSY(%2u,1)=",total+1);
    num=0;}}
fprintf(fout,"\n");
fprintf(fout,"ASSY( 1,0)=%10.6f,",1.e-6);
num=1;
total=1;
cycle=0;
time=0;
while(time<maxtime)
  {total++;
  fprintf(ferr,"%d %f %f\n",cycle,time,times[cycle]);
  if(time>=times[cycle]-eps)cycle++;
  time+=dtimes[cycle];
  fprintf(fout,"%10.2f,",time);
  if(num<5)num++;
  else
    {if(time<maxtime)fprintf(fout,"\nASSY(%2u,0)=",total+1);
    num=0;}}
fprintf(fout,"\n");
fprintf(fout,"ASSY( 0,1)=1.0\n");
fprintf(fout,"/COM, ");
```

```
fprintf(fout,"*********************************************************************\n");
fprintf(fout,"/EOF\n");}

float icheck(float age,float burn, float rich,int type)
{int i=0,j=0;
float x;
if(age<1)
  {printf("Age cannot be less than 1.  Please try again\n");
  exit(0);}
if(burn>refburnup[5][type])
  {printf("Burnup too high, please try again\n");
  exit(0);}
if(burn<refburnup[0][type])
  {printf("Burnup too low, please try again\n");
  exit(0);}
while((i<5)&&(burn>refburnup[i][type]+1))i++;
if (burn==refburnup[i][type]) bmatch=1;
if(rich>0)
  {if((bmatch==1)&&((rich<assay[i][type][0])||(rich>assay[i][type][2])))
      {printf("Enrichment must be between %-.3f and %-.3f\n",
          assay[i][type][0],assay[i][type][2]);
      printf("Please try again\n");
      exit(0);}
  else if((bmatch==0)&&((rich<assay[i][type][0])||(rich>assay[i-1][type][2])))
      {printf("Enrichment must be between %-.3f and %-.3f\n",
          assay[i][type][0],assay[i-1][type][2]);
      printf("Please try again\n");
      exit(0);}}
if(rich==0)              //Compute average enrichment
  if (bmatch==1) return(assay[i][type][1]);
  else
    {x=assay[i-1][type][1]+(burn-refburnup[i-1][type])*
       (assay[i][type][1]-assay[i-1][type][1])/
       (refburnup[i][type]-refburnup[i-1][type]);
    return(x);}
return(0);}

void buildref()
{int i,j,k,m,dummyd;
char dummyc,buf[300],c;
FILE *fin;
if ((fin=fopen("heatdat.dat","r"))==NULL)
  {printf("Cant open heatdat\n");exit(0);}
j=0;k=0;i=0;
while(fgets(buf,300,fin)!=NULL)
  if(((c=buf[0])=='B')||(c=='P'))
    {j=(c=='B')?0:1;
    refburnup[i][j]=getfloat(buf,4,7);
    assay[i][j][k]=getfloat(buf,13,5);
    if(++k>2)
      {k=0;
      i++;}
    if(i>5)i=0;}
fclose(fin);}

float getfloat(char string[300], int start, int length)
{char temp[20];
int i,j;
for(i=start;i<start+length;i++) temp[i-start]=string[i];
temp[length]='\0';
return(atof(temp));}
```

```
/*wpbin00d.cpp Program to tabulate statistics according to a standard,
 *regular, set of bins, or a special set of bins defined by limits on
 *a set of records.  This version has been extended to output to
 *the variable maxtime, which is now set to 900,000 years.
 *This program uses the verified routines in for computing assembly
 *heat, the object modules for which are incorporated in the link
 *command, as described below.
 *The command for compiling only is \msvc\bin\cl /c /FPi87 /AH wpbin00d.cpp
 *The command for linking is
    \msvc\bin\link wpbin00d.obj heatmdh.obj gethtmdh.obj,,,,;
 *The executable will be wpbin00d.exe          */

#include <string.h>
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include <malloc.h>
#include <string.h>
#include <ctype.h>
#include <time.h>
#define MAIN
#include "heat.h"
#define YEARS 40
#define CRITS 85
#define BHEATS 100
#define PHEATS 200
#define MAXBINS 20
#define FIRSTPYR 2010
#define TSTEPS 300

void ansysout(int),avsout(int);
int stdhbin(char,float),stdcbin(float),spcbin(int,char,float,float);
float getfloat(char*,int,int),avages[MAXBINS]={0},avrichs[MAXBINS]={0},avburns[MAXBINS]={0};
float mcritsp[CRITS]={0},mheatsp[PHEATS]={0},mcumhp[PHEATS]={0},
     mcumcp[CRITS]={0},mcritsb[CRITS]={0},mheatsb[BHEATS]={0},
     mcumhb[BHEATS]={0},mcumcb[CRITS]={0},
     mbins[MAXBINS][YEARS]={{0}},totheats[MAXBINS][TSTEPS]={{0}},
     avheats[2][TSTEPS]={{0}},avmtu[2]={0};
long int count=0,ntotalb=0,ntotalp=0,nobins[5]={0},maxtime=900000;
//Heat h;                    // Use this only for Quickwin application
int nbinrecs,getint(char*,int,int),ncount=0,bincap[MAXBINS],
   ansyssteps=0;
FILE *ferr;
FILE *fout,*foutd,*find,*finp;
long int ncritsp[CRITS]={0},nheatsp[PHEATS]={0},ncumhp[PHEATS]={0},
     ncumcp[CRITS]={0},ncritsb[CRITS]={0},nheatsb[BHEATS]={0},
     ncumhb[BHEATS]={0},ncumcb[CRITS]={0},assybpyr[YEARS]={0},
     nbins[MAXBINS][YEARS],npkgs[MAXBINS][YEARS],assyppyr[YEARS]={0},
     totalassy[MAXBINS]={0};
float minheat[MAXBINS],maxheat[MAXBINS],mink[MAXBINS],
             maxk[MAXBINS],mtupyr[YEARS]={0},mobins[5]={0},
             totalmtu[MAXBINS]={0},totalpkg[MAXBINS]={0};
char brectype[MAXBINS],binstr[20][6]={"BIN1","BIN2","BIN3","BIN4","BIN5",
     "BIN6","BIN7","BIN8","BIN9","BIN10","BIN11","BIN12","BIN13","BIN14",
     "BIN15","BIN16","BIN17","BIN18","BIN19","BIN20"},
     avstr[2][5]={"ABWR","APWR"};
float /*x,lastheat,burnup,old,fnew,*/ftime,eps=.00001,
     times[]={.1, 1.0, 10.0, 100.0, 1000.0,10000.0,100000,900000},
     dtimes[]={.01, .05, .5, 5, 50, 500,5000,50000};

void main()
{int i,j,k,ndyr,npyr,yr,m,na,nh,nk,lastpyr=0,timelimit,atype,
   ndx,cycle,total,ii,rcount=0;
long int gtotalassy=0;
float age,b,heat,w,a,c,cumheat=0,mtupassy,avage=0,
        gtotalmtu=0,x,
        kinf,cumcrit=0, wtotalb=0,wtotalp=0,youngtotal=0,gtotalpkg=0;
char buffer[300],type,inname[13],outname[13],datname[13],title[50],rname[15],
    subtitle[50],datestr[15],outchar[3]={'b','p','s'},*p;
if ((finp=fopen("wpbin00d.in","r"))==NULL)
```

```
  {printf("Can't open input parameter file\n");exit(0);}
_strdate(datestr);
fgets(buffer,100,finp);  /*readthrough labels*/
fgets(buffer,100,finp);
sscanf(buffer,"%d %s %s %s %d",&nbinrecs,inname,outname,title,&timelimit);
p=strchr(outname,'.');
m=p-outname;
strncpy(datname,outname,m);
datname[m]='\0';
strcat(datname,".dat");
fgets(buffer,100,finp);  //readthrough more labels
for(i=0;i<nbinrecs;i++)
  {fgets(buffer,100,finp);
  sscanf(buffer,"%c %d %f %f %f %f\n",&brectype[i],&bincap[i],
     &minheat[i],&maxheat[i],&mink[i],&maxk[i]);}
if ((find=fopen(inname,"r"))==NULL)
  {printf("Can't open input data file %s\n",inname);exit(0);}
fout=fopen(outname,"w");
foutd=fopen(datname,"w");
ferr=fopen("junk.out","w");
while(fgets(buffer,300,find)!=NULL)
  {w=getfloat(buffer,21,10);
  rcount++;
  if(rcount%1000==0)printf("%d Records read\n",rcount);
  b=getfloat(buffer,51,10);
  ndyr=getint(buffer,71,8);
  npyr=getint(buffer,287,4);
  type=tolower(buffer[123]);
  na=getint(buffer,31,10);
  a=getfloat(buffer,41,10);
  strncpy(rname,buffer+1,11);
  rname[11]='\0';
  if((na>0)&&(npyr<=timelimit)&&(npyr>0)&&((type=='p')||(type=='b')))
     {j=npyr-ndyr;
     yr=npyr-FIRSTPYR;
     mtupyr[yr]+=w;
     if(type=='b')assybpyr[yr]+=na;
     else assyppyr[yr]+=na;
     if(j<10)
       {fprintf(ferr,"age=%d , mass= %f\n",j,w);
       youngtotal+=na;}
     if(npyr>lastpyr)lastpyr=npyr;
     j=(j<1)?1:j;
     avage+=na*j;
     mtupassy=w/na;
     heat=mtupassy*h.GetHeat((float)j,(type=='p'?1:0),b,a);
     c=((j>40)?40:(float)j);
     if(type=='b')
       {ntotalb+=na;
       wtotalb+=w;}
     else
       {ntotalp+=na;
       wtotalp+=w;}
     b/=1000;        //Reduce for kinf regression
     if(type=='b')
       {kinf=.92601-.012598*b+.19901*a+9.49922e-5*b*b-.006702*a*a-.001243*a*b;
       if((kinf>1.4)||(b<5))fprintf(ferr,"Nassy=%d burnup=%.2f  kinf=%.3f Enrch=%.2f Dschg=%d  %s\n",
              na,b,kinf,a,ndyr,rname);}
     else
       kinf=1.06-.01*b-.002*c+.114*a+.00007081*b*b+.00007565*c*c
          -.007*a*a-.0002671*b*a-.0001145*b*c+.0002318*c*a+
           .000009366*b*c*a;
     b*=1000;        //Restore to original magnitude for another GetHeat
     if(nbinrecs==0)
       {m=(type=='b'?0:1);
       avmtu[m]+=w;
       avburns[m]+=b*na;
       avrichs[m]+=a*na;
       avages[m]+=j*na;
       ftime=1e-6;
```

```
        total=1;
        cycle=0;
        x=w*h.GetHeat(ftime+(float)j,(type=='p'?1:0),b,a);
        avheats[m][0]+=x;
        ftime=0;
        while(ftime<maxtime)
          {total++;
          if(ftime>=times[cycle]-eps)cycle++;
          ftime+=dtimes[cycle];
          x=w*h.GetHeat(ftime+(float)j,(type=='p'?1:0),b,a);
          avheats[m][total-1]+=x;}
       if(type=='b')
         {ncritsb[stdcbin(kinf)]+=na;
         nheatsb[stdhbin(type,heat)]+=na;
         mcritsb[stdcbin(kinf)]+=w;
         mheatsb[stdhbin(type,heat)]+=w;}
       else
         {ncritsp[stdcbin(kinf)]+=na;
         nheatsp[stdhbin(type,heat)]+=na;
         mcritsp[stdcbin(kinf)]+=w;
         mheatsp[stdhbin(type,heat)]+=w;}}
     else
       {if(strcmp(rname,"SOUTH TEXAS")==0) type='s';
       ndx=spcbin(nbinrecs,type,heat,kinf);
       avburns[ndx]+=b*na;
       avrichs[ndx]+=a*na;
       avages[ndx]+=j*na;
       if(ndx<nbinrecs)   //increment decay heat array for each bin
        {ftime=1e-6;
        total=1;
        cycle=0;
        x=w*h.GetHeat(ftime+(float)j,(type=='p'?1:0),b,a);
        totheats[ndx][0]+=x;
        ftime=0;
        while(ftime<maxtime)
          {total++;
          if(ftime>=times[cycle]-eps)cycle++;
          ftime+=dtimes[cycle];
          x=w*h.GetHeat(ftime+(float)j,(type=='p'?1:0),b,a);
          totheats[ndx][total-1]+=x;}}
       nbins[ndx][yr]+=na;
       mbins[ndx][yr]+=w;}}}
printf("Total assy %ld   Avg age %f  MTU B %f  MTU P %f  Final yr %d\n",
    ntotalp+ntotalb,avage/(ntotalp+ntotalb),wtotalb,wtotalp,lastpyr);
fprintf(fout,"%s\n",title);
if(nbinrecs==0) strcpy(subtitle,"Standard Table");
else sprintf(subtitle,"%d %s",nbinrecs,"Bins");
fprintf(fout,"%s\n",subtitle);
if(nbinrecs==0)
  {ncumhb[0]=nheatsb[0];
  for(i=1;i<BHEATS;i++) ncumhb[i]=nheatsb[i]+ncumhb[i-1];
  fprintf(fout,"\n\nBWR Heat Percentiles\n");
  fprintf(fout,"%10s %10s %10s %10s\n",
        "Watts/Assy","  Assy","Cum Assy","Percent");
  for(i=0;i<BHEATS-1;i++) fprintf(fout,"%10d %10ld %10ld %10.2f\n",
    (i+1)*10,nheatsb[i],ncumhb[i],(float)ncumhb[i]*100/ntotalb);
  fprintf(fout,"%10s %10ld %10ld %10.2f\n",
    "Above",nheatsb[BHEATS-1],ncumhb[BHEATS-1],
    (float)ncumhb[BHEATS-1]*100/ntotalb);
  fprintf(fout,"\n\nBWR Kinf Percentiles\n");
  fprintf(fout,"%12s %12s %12s %12s\n","     Kinf","     Assy"," CumAssy", "Percent");
  ncumcb[0]=ncritsb[0];
  for(i=1;i<CRITS;i++) ncumcb[i]=ncritsb[i]+ncumcb[i-1];
  for(i=0;i<CRITS-1;i++)
    {kinf=((float)i+1+75)/100;
    fprintf(fout,"%12.3f %12ld %12ld %12.2f\n",kinf,ncritsb[i],
                        ncumcb[i],(float)ncumcb[i]*100/ntotalb);}
  fprintf(fout,"%12s %12ld %12ld %12.2f\n","Above",ncritsb[CRITS-1],
                        ncumcb[CRITS-1],(float)ncumcb[CRITS-1]*100/ntotalb);
  ncumhp[0]=nheatsp[0];
```

```
  for(i=1;i<PHEATS;i++) ncumhp[i]=nheatsp[i]+ncumhp[i-1];
  fprintf(fout,"\n\nPWR Heat Percentiles\n");
  fprintf(fout,"%10s %10s %10s %10s\n",
     "Watts/Assy","  Assy","Cum Assy","Percent");
  for(i=0;i<PHEATS-1;i++) fprintf(fout,"%10d %10ld %10ld %10.2f\n",
    (i+1)*10,nheatsp[i],ncumhp[i],(float)ncumhp[i]*100/ntotalp);
  fprintf(fout,"%10s %10ld %10ld %10.2f\n",
    "Above",nheatsp[PHEATS-1],ncumhp[PHEATS-1],
    (float)ncumhp[PHEATS-1]*100/ntotalp);
  fprintf(fout,"\n\nPWR Kinf Percentiles\n");
  fprintf(fout,"%12s %12s %12s %12s\n","     Kinf","     Assy"," CumAssy", "Percent");
  ncumcp[0]=ncritsp[0];
  for(i=1;i<CRITS;i++) ncumcp[i]=ncritsp[i]+ncumcp[i-1];
  for(i=0;i<CRITS-1;i++)
    {kinf=((float)i+1+75)/100;
    fprintf(fout,"%12.3f %12ld %12ld %12.2f\n",kinf,ncritsp[i],
                        ncumcp[i],(float)ncumcp[i]*100/ntotalp);}
  fprintf(fout,"%12s %12ld %12ld %12.2f\n","Above",ncritsp[CRITS-1],
                        ncumcp[CRITS-1],(float)ncumcp[CRITS-1]*100/ntotalp);
  fprintf(fout,"\n\n%10s%10s%10s%10s\n","Year","MTU","B Assy","P Assy");
  for(i=0;i<=timelimit-FIRSTPYR;i++) fprintf(fout,"%10d%10.2f%10ld%10ld\n",
    i+FIRSTPYR,mtupyr[i],assybpyr[i],assyppyr[i]);
  fprintf(fout,"\n\nAverage age = %7.3f\n",avage/(ntotalb+ntotalp));}
else
  {for(i=0;i<nbinrecs;i++)
    {fprintf(fout,"\n\n\nType=%c Cap=%d Hmin=%.1f Hmax=%.1f Kmin=%.2f Kmax=%.2f\n\n",
       brectype[i],bincap[i],minheat[i],maxheat[i],mink[i],maxk[i]);
    fprintf(fout,"%12s%12s%12s%12s\n","Year","Num_Assy","Num_Pkgs","MTU");
    for(j=0;j<=lastpyr-FIRSTPYR;j++)
      {totalassy[i]+=nbins[i][j];
      totalmtu[i]+=mbins[i][j];
      totalpkg[i]+=(float)nbins[i][j]/bincap[i];
      fprintf(fout,"%12d%12ld%12.2f%12.2f\n",j+FIRSTPYR,nbins[i][j],
         (float)nbins[i][j]/bincap[i],mbins[i][j]);}
    gtotalassy+=totalassy[i];
    gtotalpkg+=totalpkg[i];
    gtotalmtu+=totalmtu[i];
    fprintf(fout,"\n%12s%12ld%12.2f%12.2f\n",
       "Bin Total",totalassy[i],totalpkg[i],totalmtu[i]);}
  for(i=0;i<3;i++)
    {for(j=0;j<=timelimit-FIRSTPYR;j++) nobins[i]+=nbins[nbinrecs+i][j];
    for(j=0;j<=timelimit-FIRSTPYR;j++) mobins[i]+=mbins[nbinrecs+i][j];
    gtotalassy+=nobins[i];
    gtotalmtu+=mobins[i];}
  fprintf(fout,"\n\nSummary Table\n");
  fprintf(fout,"%10s%10s%10s%10s%10s%10s\n","Type","Cap","Num_Assy",
     "PctType","Num_Pkg","MTU");
  for(i=0;i<nbinrecs;i++)
    fprintf(fout,"%10c%10d%10ld%10.2f%10.2f%10.2f\n",brectype[i],
      bincap[i],totalassy[i],
      (float)totalassy[i]*100/(brectype[i]=='b'?ntotalb:ntotalp),
      totalpkg[i],totalmtu[i]);
  for(i=0;i<3;i++)
    fprintf(fout,"%10c%10d%10ld%10.2f%10.2f%10.2f\n",outchar[i],
      1,nobins[i],(float)nobins[i]*100/(i==0?ntotalb:ntotalp),
      (float)nobins[i],mobins[i]);
  fprintf(fout,"\n%10s%20ld%20.2f%10.2f\n","Totals",gtotalassy,
         gtotalpkg,gtotalmtu);}
fprintf(foutd,"/COM, ");
fprintf(foutd,"*****************************************************************\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"** Assembly Heat Generation Rates: ANSYS input formats          **\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**                                                              **\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Executable File Name:   WPBIN00D.EXE                      **\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Input File Name:        %-12s%22s**\n",inname," ");
```

```
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Output File Name:       %-12s%22s**\n",datname," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Execution Date:         %-12s%22s**\n",datestr," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"*****************************************************************\n");
if(nbinrecs>0)for(i=0;i<nbinrecs;i++) ansysout(i);
else for(i=0;i<2;i++) avsout(i);
fprintf(foutd,"/COM, ");
fprintf(foutd,"*****************************************************************\n");
fprintf(foutd,"/EOF\n");
printf("Done \n");}

int stdhbin(char t, float ht)
{int n;
n=ht/10;
if((10*n-ht)==0)n--;
if(n<0) n=0;
else
  {if (t=='b') if(n>BHEATS-1) n=BHEATS-1;
  else if(n>PHEATS-1) n=PHEATS-1;}
return n;}

int stdcbin(float k)
{int n;
n=(int)(100*k-75);
if((100*k-75-n)==0)n--;
if(n<0) n=0;
 else if(n>CRITS-1) n=CRITS-1;
return n;}

int spcbin(int num,char t,float ht, float k)
{int found=0,i=0;
while((found==0)&&(i<num))
  {if((brectype[i]==t)&&
     (ht>minheat[i])&&(ht<=maxheat[i])&&
     (k>mink[i])&&(k<=maxk[i])) found=1;
  i++;}
if(found==1)return(i-1);
else
  {fprintf(ferr,"No bin for %c %f %f\n",t,ht,k);
  if(t=='p') num++;     //default adds 0 for t=='b'
  else if(t=='s') num+=2;
  return num;}}

float getfloat(char* string, int start, int length)
{char temp[20];
int i,j;
for(i=start;i<start+length;i++) temp[i-start]=string[i];
temp[length]='\0';
return(atof(temp));}

int getint(char*string, int start, int length)
{char temp[20];
int i,j;
for(i=start;i<start+length;i++) temp[i-start]=string[i];
temp[length]='\0';
return(atoi(temp));}

void ansysout(int bin)
{int i,total,cycle,num;
long int m;
float ftime,x;
m=totalassy[bin];
fprintf(foutd,"/COM, ");
fprintf(foutd,"*****************************************************************\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**                                                              **\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Assembly Type:          %-12s%22s**\n",
```

```
                    ((brectype[bin]=='b')?"BWR":
                    (brectype[bin]=='p')?"PWR":"STx"),"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Decay Period (years):   %-12ld%22s**\n",maxtime,"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Number of assemblies:   %-12ld%22s**\n",m,"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Assemblies/pkg:         %-12d%22s**\n",bincap[bin],"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Max Heat (Watts/assy):  %-12.2f%22s**\n",maxheat[bin],"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Min Heat (Watts/assy):  %-12.2f%22s**\n",minheat[bin],"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Max Kinf:               %-12.3f%22s**\n",maxk[bin],"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Min Kinf:               %-12.3f%22s**\n",mink[bin],"  ");
if(m>0)
{fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Ave Age:                %-12.3f%22s**\n",avages[bin]/m,"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Ave Burnup:             %-12.3f%22s**\n",avburns[bin]/m,"  ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"**    Ave Enrichment:         %-12.3f%22s**\n",avrichs[bin]/m,"  ");}
if(m>0)
 {fprintf(foutd,"/COM, ");
 fprintf(foutd,"**    Ave MTU/assy:           %-12.3f%22s**\n",totalmtu[bin]/m,"  ");}
fprintf(foutd,"/COM, ");
fprintf(foutd,"**                                                                    **\n");
fprintf(foutd,"/COM, ");
fprintf(foutd,"*********************************************************************\n");
ansyssteps=0;
cycle=0;
ftime=0;
while(ftime<maxtime)
  {ansyssteps++;
  if(ftime>=times[cycle]-eps)cycle++;
  ftime+=dtimes[cycle];}
fprintf(foutd,"*SET,%s,\n",binstr[bin]);
fprintf(foutd,"*DIM,%s,TABLE,%d,1,\n",binstr[bin],ansyssteps+1);
total=1;
cycle=0;
ftime=0;
num=1;
if(m==0) return;      //No assemblies to process in this bin.
for(i=0;i<TSTEPS;i++) totheats[bin][i]/=m;
fprintf(foutd,"%s( 1,1)=%9.2f,",binstr[bin],totheats[bin][0]);
while(ftime<maxtime)
  {total++;
  if(ftime>=times[cycle]-eps)cycle++;
  ftime+=dtimes[cycle];
  x=totheats[bin][total-1];
  if(x<1)fprintf(foutd,"%9.3f,",x);
  else fprintf(foutd,"%9.2f,",x);
  if(num<5)num++;
  else
    {if(ftime<maxtime)fprintf(foutd,"\n%s(%2u,1)=",binstr[bin],total+1);
    num=0;}}
fprintf(foutd,"\n");
fprintf(foutd,"%s( 1,0)=%10.6f,",binstr[bin],1.e-6);
num=1;
total=1;
cycle=0;
ftime=0;
while(ftime<maxtime)
  {total++;
  if(ftime>=times[cycle]-eps)cycle++;
  ftime+=dtimes[cycle];
  fprintf(foutd,"%10.2f,",ftime);
  if(num<5)num++;
  else
```

```
    {if(ftime<maxtime)fprintf(foutd,"\n%s(%2u,0)=",binstr[bin],total+1);
    num=0;}}
fprintf(foutd,"\n");
fprintf(foutd,"%s( 0,1)=1.0\n",binstr[bin]);
return;}

void avsout(int bin)      //values of bin=0,1 for BWR, PWR
{int i,total,cycle,num;
long int m;
float x,ftime;
m=(bin==0?ntotalb:ntotalp);
fprintf(foutd,"/COM, ");
fprintf(foutd,"*****************************************************************************\n");
fprintf(foutd,"/COM, ");                                                                  **\n");
fprintf(foutd,"***
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Assembly Type:          %-12s%22s**\n",(bin==0)?"BWR":"PWR"," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Decay Period (years):   %-12ld%22s**\n",maxtime," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Number of assemblies:   %-12ld%22s**\n",m," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Ave Age:                %-12.3f%22s**\n",avages[bin]/m," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Ave Burnup:             %-12.3f%22s**\n",avburns[bin]/m," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Ave Enrichment:         %-12.3f%22s**\n",avrichs[bin]/m," ");
fprintf(foutd,"/COM, ");
fprintf(foutd,"***    Ave MTU/assy:           %-12.3f%22s**\n",avmtu[bin]/m," ");
fprintf(foutd,"/COM, ");                                                                  **\n");
fprintf(foutd,"***
fprintf(foutd,"/COM, ");
fprintf(foutd,"*****************************************************************************\n");
ansyssteps=0;
cycle=0;
ftime=0;
while(ftime<maxtime)
  {ansyssteps++;
  if(ftime>=times[cycle]-eps)cycle++;
  ftime+=dtimes[cycle];}
fprintf(foutd,"*SET,%s,\n",avstr[bin]);
fprintf(foutd,"*DIM,%s,TABLE,%d,1,\n",avstr[bin],ansyssteps+1);
total=1;
cycle=0;
ftime=0;
num=1;
if(m==0) return;      //No assemblies to process in this bin.
for(i=0;i<TSTEPS;i++) avheats[bin][i]/=m;
fprintf(foutd,"%s( 1,1)=%9.2f,",avstr[bin],avheats[bin][0]);
while(ftime<maxtime)
  {total++;
  if(ftime>=times[cycle]-eps)cycle++;
  ftime+=dtimes[cycle];
  x=avheats[bin][total-1];
  if(x<1)fprintf(foutd,"%9.3f,",x);
  else fprintf(foutd,"%9.2f,",x);
  if(num<5)num++;
  else
    {if(ftime<maxtime)fprintf(foutd,"\n%s(%2u,1)=",avstr[bin],total+1);
    num=0;}}
fprintf(foutd,"\n");
fprintf(foutd,"%s( 1,0)=%10.6f,",avstr[bin],1.e-6);
num=1;
total=1;
cycle=0;
ftime=0;
while(ftime<maxtime)
  {total++;
  if(ftime>=times[cycle]-eps)cycle++;
  ftime+=dtimes[cycle];
```

```
  fprintf(foutd,"%10.2f,",ftime);
  if(num<5)num++;
  else
    {if(ftime<maxtime)fprintf(foutd,"\n%s(%2u,0)=",avstr[bin],total+1);
    num=0;}}
fprintf(foutd,"\n");
fprintf(foutd,"%s( 0,1)=1.0\n",avstr[bin]);
return;}
```

```
 -.503800   .121756  -.001018
  .196200   .121756  -.001018
  .896200   .121756  -.001018
  .169400   .085366  -.000851
  .869400   .085366  -.000851
 1.569400   .085366  -.000851
5A TOTAL HEAT 92        1.      2.      3.      4.      5.      6.      7.      8.      9.     10.     11.     12.     13.     14.     15.     16.     17.     18.     19.     20.
                       21.     22.     23.     24.     25.     26.     27.     28.     29.     30.     31.     32.     33.     34.     35.     36.     37.     38.     39.     40.
                       41.     42.     43.     44.     45.     46.     47.     48.     49.     50.     51.     52.     53.     54.     55.     56.     57.     58.     59.     60.
                       61.     62.     63.     64.     65.     66.     67.     68.     69.     70.     71.     72.     73.     74.     75.     76.     77.     78.     79.     80.
                       81.     82.     83.     84.     85.     86.     87.     88.     89.     90.     91.     92.     93.     94.     95.     96.     97.     98.     99.    100.
                      101.    102.    103.    104.    105.    106.    107.    108.    109.    110.    111.    112.    113.    114.    115.    116.    117.    118.    119.    120.
                      121.    122.    123.    124.    125.    126.    127.    128.    129.    130.    140.    150.    200.    250.    300.    400.    500.    700.   1000.   1500.
                     2000.   2500.   3000.   4000.   5000.   7000.  10000.  20000.  50000. 100000.
BWR  7500.    .72 4.081E+03 1.881E+03 1.062E+03 6.797E+02 4.958E+02 4.005E+02 3.494E+02 3.196E+02 3.009E+02 2.887E+02 2.786E+02 2.712E+02 2.652E+02 2.600E+02 2.561E+02 2.515E+02 2.478E+02 2.443E+02 2.411E+02 2.385E+02
                 2.351E+02 2.323E+02 2.297E+02 2.272E+02 2.247E+02 2.223E+02 2.200E+02 2.177E+02 2.155E+02 2.137E+02 2.113E+02 2.092E+02 2.072E+02 2.052E+02 2.032E+02 2.012E+02 1.992E+02 1.975E+02 1.956E+02 1.938E+02
                 1.920E+02 1.903E+02 1.885E+02 1.868E+02 1.851E+02 1.835E+02 1.819E+02 1.803E+02 1.787E+02 1.776E+02 1.757E+02 1.742E+02 1.727E+02 1.713E+02 1.699E+02 1.685E+02 1.671E+02 1.658E+02 1.645E+02 1.632E+02
                 1.619E+02 1.606E+02 1.594E+02 1.581E+02 1.569E+02 1.558E+02 1.546E+02 1.534E+02 1.523E+02 1.512E+02 1.501E+02 1.490E+02 1.480E+02 1.470E+02 1.459E+02 1.449E+02 1.439E+02 1.430E+02 1.420E+02 1.411E+02
                 1.402E+02 1.393E+02 1.384E+02 1.375E+02 1.366E+02 1.358E+02 1.350E+02 1.341E+02 1.333E+02 1.326E+02 1.318E+02 1.310E+02 1.303E+02 1.295E+02 1.288E+02 1.281E+02 1.274E+02 1.267E+02 1.260E+02 1.258E+02
                 1.248E+02 1.242E+02 1.235E+02 1.229E+02 1.223E+02 1.217E+02 1.211E+02 1.205E+02 1.200E+02 1.194E+02 1.189E+02 1.183E+02 1.178E+02 1.173E+02 1.168E+02 1.162E+02 1.157E+02 1.153E+02 1.148E+02 1.143E+02
                 1.138E+02 1.134E+02 1.129E+02 1.125E+02 1.120E+02 1.116E+02 1.112E+02 1.107E+02 1.103E+02 1.099E+02 1.061E+02 1.028E+02 9.135E+01 8.352E+01 7.753E+01 6.751E+01 5.945E+01 4.672E+01 3.404E+01 2.244E+01
                 1.710E+01 1.442E+01 1.308E+01 1.166E+01 1.092E+01 9.672E+00 8.278E+00 5.243E+00 1.971E+00 5.958E-01
BWR  7500.   1.05 3.656E+03 1.651E+03 9.297E+02 5.970E+02 4.382E+02 3.564E+02 3.128E+02 2.874E+02 2.711E+02 2.602E+02 2.511E+02 2.443E+02 2.386E+02 2.337E+02 2.296E+02 2.253E+02 2.216E+02 2.181E+02 2.148E+02 2.120E+02
                 2.086E+02 2.058E+02 2.031E+02 2.005E+02 1.979E+02 1.955E+02 1.930E+02 1.907E+02 1.884E+02 1.864E+02 1.840E+02 1.819E+02 1.798E+02 1.777E+02 1.757E+02 1.737E+02 1.718E+02 1.699E+02 1.680E+02 1.662E+02
                 1.644E+02 1.626E+02 1.608E+02 1.591E+02 1.575E+02 1.558E+02 1.542E+02 1.526E+02 1.510E+02 1.498E+02 1.480E+02 1.465E+02 1.451E+02 1.437E+02 1.423E+02 1.409E+02 1.396E+02 1.383E+02 1.370E+02 1.357E+02
                 1.344E+02 1.332E+02 1.320E+02 1.308E+02 1.297E+02 1.285E+02 1.274E+02 1.263E+02 1.252E+02 1.242E+02 1.231E+02 1.221E+02 1.211E+02 1.201E+02 1.191E+02 1.182E+02 1.172E+02 1.163E+02 1.154E+02 1.145E+02
                 1.137E+02 1.128E+02 1.120E+02 1.112E+02 1.104E+02 1.096E+02 1.088E+02 1.080E+02 1.073E+02 1.065E+02 1.058E+02 1.051E+02 1.044E+02 1.037E+02 1.030E+02 1.024E+02 1.017E+02 1.011E+02 1.005E+02 1.002E+02
                 9.940E+01 9.880E+01 9.822E+01 9.765E+01 9.709E+01 9.654E+01 9.601E+01 9.548E+01 9.496E+01 9.445E+01 9.395E+01 9.346E+01 9.297E+01 9.250E+01 9.203E+01 9.157E+01 9.112E+01 9.068E+01 9.024E+01 8.981E+01
                 8.939E+01 8.897E+01 8.857E+01 8.817E+01 8.777E+01 8.738E+01 8.700E+01 8.663E+01 8.626E+01 8.590E+01 8.257E+01 7.972E+01 7.012E+01 6.397E+01 5.949E+01 5.202E+01 4.612E+01 3.674E+01 2.737E+01 1.876E+01
                 1.478E+01 1.274E+01 1.166E+01 1.054E+01 9.917E+00 8.826E+00 7.587E+00 4.868E+00 1.859E+00 5.676E-01
BWR  7500.   1.75 3.385E+03 1.494E+03 8.399E+02 5.430E+02 4.037E+02 3.324E+02 2.946E+02 2.722E+02 2.576E+02 2.475E+02 2.388E+02 2.321E+02 2.262E+02 2.209E+02 2.165E+02 2.118E+02 2.077E+02 2.039E+02 2.001E+02 1.967E+02
                 1.928E+02 1.896E+02 1.866E+02 1.835E+02 1.806E+02 1.778E+02 1.750E+02 1.723E+02 1.696E+02 1.672E+02 1.644E+02 1.620E+02 1.596E+02 1.572E+02 1.549E+02 1.527E+02 1.505E+02 1.483E+02 1.462E+02 1.442E+02
                 1.422E+02 1.402E+02 1.382E+02 1.364E+02 1.345E+02 1.327E+02 1.309E+02 1.291E+02 1.274E+02 1.260E+02 1.241E+02 1.225E+02 1.209E+02 1.194E+02 1.179E+02 1.164E+02 1.150E+02 1.136E+02 1.122E+02 1.108E+02
                 1.095E+02 1.082E+02 1.069E+02 1.057E+02 1.044E+02 1.032E+02 1.020E+02 1.009E+02 9.978E+01 9.865E+01 9.757E+01 9.650E+01 9.546E+01 9.443E+01 9.343E+01 9.245E+01 9.149E+01 9.055E+01 8.962E+01 8.872E+01
                 8.783E+01 8.696E+01 8.611E+01 8.527E+01 8.446E+01 8.366E+01 8.287E+01 8.210E+01 8.135E+01 8.061E+01 7.989E+01 7.918E+01 7.848E+01 7.780E+01 7.714E+01 7.648E+01 7.584E+01 7.521E+01 7.460E+01 7.416E+01
                 7.350E+01 7.291E+01 7.234E+01 7.179E+01 7.124E+01 7.071E+01 7.018E+01 6.967E+01 6.917E+01 6.868E+01 6.819E+01 6.772E+01 6.725E+01 6.680E+01 6.635E+01 6.591E+01 6.548E+01 6.506E+01 6.465E+01 6.424E+01
                 6.384E+01 6.345E+01 6.307E+01 6.269E+01 6.232E+01 6.196E+01 6.161E+01 6.126E+01 6.092E+01 6.058E+01 5.754E+01 5.501E+01 4.708E+01 4.260E+01 3.963E+01 3.494E+01 3.128E+01 2.546E+01 1.969E+01 1.432E+01
                 1.181E+01 1.049E+01 9.762E+00 8.954E+00 8.457E+00 7.572E+00 6.561E+00 4.300E+00 1.699E+00 5.527E-01
BWR 15000.   1.09 5.818E+03 2.863E+03 1.698E+03 1.144E+03 8.692E+02 7.198E+02 6.362E+02 5.848E+02 5.506E+02 5.277E+02 5.074E+02 4.924E+02 4.799E+02 4.691E+02 4.611E+02 4.511E+02 4.431E+02 4.357E+02 4.288E+02 4.236E+02
                 4.160E+02 4.100E+02 4.043E+02 3.988E+02 3.934E+02 3.883E+02 3.832E+02 3.783E+02 3.735E+02 3.702E+02 3.650E+02 3.605E+02 3.561E+02 3.518E+02 3.477E+02 3.436E+02 3.396E+02 3.357E+02 3.319E+02 3.281E+02
                 3.244E+02 3.208E+02 3.173E+02 3.138E+02 3.104E+02 3.070E+02 3.037E+02 3.005E+02 2.973E+02 2.951E+02 2.914E+02 2.883E+02 2.854E+02 2.825E+02 2.797E+02 2.770E+02 2.743E+02 2.716E+02 2.690E+02 2.664E+02
                 2.639E+02 2.615E+02 2.591E+02 2.567E+02 2.543E+02 2.520E+02 2.498E+02 2.476E+02 2.454E+02 2.433E+02 2.412E+02 2.391E+02 2.371E+02 2.352E+02 2.332E+02 2.313E+02 2.294E+02 2.276E+02 2.258E+02 2.240E+02
                 2.223E+02 2.206E+02 2.189E+02 2.173E+02 2.156E+02 2.141E+02 2.125E+02 2.110E+02 2.095E+02 2.080E+02 2.065E+02 2.051E+02 2.037E+02 2.024E+02 2.010E+02 1.997E+02 1.984E+02 1.971E+02 1.959E+02 1.954E+02
                 1.939E+02 1.926E+02 1.914E+02 1.902E+02 1.891E+02 1.880E+02 1.869E+02 1.859E+02 1.848E+02 1.838E+02 1.828E+02 1.818E+02 1.808E+02 1.798E+02 1.789E+02 1.780E+02 1.770E+02 1.761E+02 1.753E+02 1.744E+02
                 1.735E+02 1.727E+02 1.719E+02 1.711E+02 1.703E+02 1.695E+02 1.687E+02 1.679E+02 1.672E+02 1.664E+02 1.596E+02 1.538E+02 1.339E+02 1.208E+02 1.114E+02 9.586E+01 8.388E+01 6.511E+01 4.669E+01 2.990E+01
                 2.218E+01 1.835E+01 1.638E+01 1.447E+01 1.348E+01 1.182E+01 1.002E+01 6.163E+00 2.278E+00 7.455E-01
BWR 15000.   1.79 5.359E+03 2.613E+03 1.553E+03 1.054E+03 8.094E+02 6.775E+02 6.035E+02 5.577E+02 5.269E+02 5.055E+02 4.870E+02 4.728E+02 4.608E+02 4.502E+02 4.418E+02 4.329E+02 4.242E+02 4.167E+02 4.096E+02 4.037E+02
                 3.963E+02 3.901E+02 3.841E+02 3.783E+02 3.728E+02 3.673E+02 3.621E+02 3.569E+02 3.519E+02 3.478E+02 3.424E+02 3.377E+02 3.331E+02 3.286E+02 3.242E+02 3.199E+02 3.158E+02 3.116E+02 3.076E+02 3.037E+02
                 2.998E+02 2.960E+02 2.923E+02 2.887E+02 2.851E+02 2.816E+02 2.781E+02 2.748E+02 2.715E+02 2.690E+02 2.661E+02 2.620E+02 2.589E+02 2.559E+02 2.530E+02 2.502E+02 2.474E+02 2.446E+02 2.420E+02 2.395E+02
                 2.367E+02 2.342E+02 2.317E+02 2.292E+02 2.268E+02 2.245E+02 2.222E+02 2.199E+02 2.177E+02 2.155E+02 2.134E+02 2.113E+02 2.092E+02 2.072E+02 2.052E+02 2.033E+02 2.014E+02 1.995E+02 1.977E+02 1.959E+02
                 1.941E+02 1.924E+02 1.907E+02 1.890E+02 1.874E+02 1.858E+02 1.842E+02 1.827E+02 1.812E+02 1.797E+02 1.783E+02 1.768E+02 1.754E+02 1.741E+02 1.727E+02 1.714E+02 1.701E+02 1.688E+02 1.676E+02 1.670E+02
                 1.657E+02 1.645E+02 1.633E+02 1.621E+02 1.610E+02 1.599E+02 1.589E+02 1.578E+02 1.568E+02 1.558E+02 1.548E+02 1.538E+02 1.528E+02 1.519E+02 1.510E+02 1.501E+02 1.492E+02 1.483E+02 1.474E+02 1.466E+02
                 1.458E+02 1.449E+02 1.441E+02 1.433E+02 1.426E+02 1.418E+02 1.411E+02 1.403E+02 1.396E+02 1.389E+02 1.324E+02 1.269E+02 1.088E+02 9.782E+01 9.013E+01 7.785E+01 6.838E+01 5.358E+01 3.904E+01 2.578E+01
                 1.962E+01 1.653E+01 1.492E+01 1.331E+01 1.244E+01 1.094E+01 9.321E+00 5.808E+00 2.185E+00 7.299E-01
BWR 15000.   2.49 5.046E+03 2.439E+03 1.452E+03 9.921E+02 7.692E+02 6.491E+02 5.821E+02 5.404E+02 5.120E+02 4.921E+02 4.745E+02 4.607E+02 4.487E+02 4.381E+02 4.292E+02 4.197E+02 4.113E+02 4.035E+02 3.961E+02 3.895E+02
                 3.820E+02 3.754E+02 3.691E+02 3.630E+02 3.570E+02 3.512E+02 3.456E+02 3.401E+02 3.348E+02 3.300E+02 3.246E+02 3.196E+02 3.147E+02 3.099E+02 3.053E+02 3.007E+02 2.963E+02 2.919E+02 2.876E+02 2.835E+02
                 2.794E+02 2.754E+02 2.714E+02 2.676E+02 2.638E+02 2.602E+02 2.566E+02 2.530E+02 2.496E+02 2.466E+02 2.430E+02 2.397E+02 2.366E+02 2.334E+02 2.304E+02 2.274E+02 2.245E+02 2.216E+02 2.188E+02 2.161E+02
                 2.134E+02 2.107E+02 2.081E+02 2.056E+02 2.031E+02 2.007E+02 1.983E+02 1.960E+02 1.937E+02 1.914E+02 1.892E+02 1.871E+02 1.850E+02 1.829E+02 1.809E+02 1.789E+02 1.769E+02 1.750E+02 1.732E+02 1.713E+02
                 1.695E+02 1.678E+02 1.661E+02 1.644E+02 1.627E+02 1.611E+02 1.595E+02 1.580E+02 1.564E+02 1.549E+02 1.535E+02 1.520E+02 1.505E+02 1.493E+02 1.479E+02 1.466E+02 1.453E+02 1.440E+02 1.428E+02 1.420E+02
                 1.405E+02 1.393E+02 1.381E+02 1.370E+02 1.359E+02 1.348E+02 1.338E+02 1.327E+02 1.317E+02 1.307E+02 1.297E+02 1.288E+02 1.278E+02 1.269E+02 1.260E+02 1.251E+02 1.243E+02 1.234E+02 1.226E+02 1.217E+02
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                1.209E+02 1.201E+02 1.194E+02 1.186E+02 1.178E+02 1.171E+02 1.164E+02 1.157E+02 1.150E+02 1.143E+02 1.081E+02 1.029E+02 8.662E+01 7.742E+01 7.130E+01 6.181E+01 5.456E+01 4.326E+01 3.212E+01 2.191E+01
                1.718E+01 1.476E+01 1.347E+01 1.214E+01 1.139E+01 1.005E+01 8.602E+00 5.431E+00 2.092E+00 7.231E-01
BWR 22500.  1.72  7.089E+03 3.699E+03 2.276E+03 1.608E+03 1.268E+03 1.074E+03 9.601E+02 8.868E+02 8.358E+02 8.005E+02 7.682E+02 7.438E+02 7.230E+02 7.049E+02 6.908E+02 6.733E+02 6.597E+02 6.470E+02 6.351E+02 6.263E+02
                6.139E+02 6.034E+02 5.934E+02 5.838E+02 5.745E+02 5.655E+02 5.568E+02 5.483E+02 5.401E+02 5.335E+02 5.247E+02 5.169E+02 5.094E+02 5.021E+02 4.950E+02 4.881E+02 4.813E+02 4.747E+02 4.682E+02 4.618E+02
                4.557E+02 4.496E+02 4.437E+02 4.378E+02 4.322E+02 4.266E+02 4.211E+02 4.158E+02 4.106E+02 4.068E+02 4.007E+02 3.957E+02 3.908E+02 3.861E+02 3.816E+02 3.771E+02 3.727E+02 3.684E+02 3.642E+02 3.601E+02
                3.560E+02 3.520E+02 3.481E+02 3.443E+02 3.405E+02 3.369E+02 3.333E+02 3.298E+02 3.264E+02 3.230E+02 3.197E+02 3.164E+02 3.132E+02 3.101E+02 3.071E+02 3.041E+02 3.011E+02 2.982E+02 2.954E+02 2.926E+02
                2.899E+02 2.872E+02 2.846E+02 2.821E+02 2.796E+02 2.771E+02 2.747E+02 2.723E+02 2.700E+02 2.677E+02 2.655E+02 2.633E+02 2.611E+02 2.590E+02 2.569E+02 2.549E+02 2.529E+02 2.509E+02 2.490E+02 2.483E+02
                2.459E+02 2.440E+02 2.422E+02 2.404E+02 2.387E+02 2.370E+02 2.354E+02 2.337E+02 2.321E+02 2.306E+02 2.290E+02 2.275E+02 2.261E+02 2.246E+02 2.232E+02 2.218E+02 2.204E+02 2.191E+02 2.177E+02 2.164E+02
                2.151E+02 2.139E+02 2.126E+02 2.114E+02 2.102E+02 2.090E+02 2.079E+02 2.067E+02 2.056E+02 2.045E+02 1.945E+02 1.859E+02 1.577E+02 1.400E+02 1.280E+02 1.091E+02 9.511E+01 7.370E+01 5.301E+01 3.420E+01
                2.553E+01 2.119E+01 1.894E+01 1.671E+01 1.556E+01 1.354E+01 1.142E+01 6.881E+00 2.525E+00 8.879E-01
BWR 22500.  2.42  6.606E+03 3.395E+03 2.116E+03 1.501E+03 1.191E+03 1.016E+03 9.130E+02 8.466E+02 8.001E+02 7.670E+02 7.371E+02 7.145E+02 6.950E+02 6.778E+02 6.643E+02 6.486E+02 6.353E+02 6.230E+02 6.113E+02 6.018E+02
                5.897E+02 5.794E+02 5.696E+02 5.601E+02 5.510E+02 5.421E+02 5.334E+02 5.250E+02 5.168E+02 5.103E+02 5.014E+02 4.937E+02 4.862E+02 4.789E+02 4.719E+02 4.649E+02 4.582E+02 4.515E+02 4.451E+02 4.387E+02
                4.325E+02 4.264E+02 4.205E+02 4.147E+02 4.090E+02 4.034E+02 3.979E+02 3.926E+02 3.874E+02 3.835E+02 3.777E+02 3.727E+02 3.679E+02 3.632E+02 3.586E+02 3.541E+02 3.497E+02 3.454E+02 3.412E+02 3.370E+02
                3.330E+02 3.290E+02 3.251E+02 3.212E+02 3.175E+02 3.138E+02 3.102E+02 3.067E+02 3.032E+02 2.999E+02 2.965E+02 2.933E+02 2.901E+02 2.870E+02 2.839E+02 2.809E+02 2.780E+02 2.751E+02 2.722E+02 2.695E+02
                2.668E+02 2.641E+02 2.615E+02 2.589E+02 2.564E+02 2.540E+02 2.515E+02 2.492E+02 2.469E+02 2.446E+02 2.424E+02 2.402E+02 2.380E+02 2.359E+02 2.339E+02 2.319E+02 2.299E+02 2.279E+02 2.260E+02 2.250E+02
                2.229E+02 2.209E+02 2.191E+02 2.174E+02 2.157E+02 2.140E+02 2.124E+02 2.108E+02 2.092E+02 2.077E+02 2.062E+02 2.047E+02 2.032E+02 2.018E+02 2.004E+02 1.990E+02 1.977E+02 1.963E+02 1.950E+02 1.937E+02
                1.925E+02 1.913E+02 1.900E+02 1.888E+02 1.877E+02 1.865E+02 1.854E+02 1.843E+02 1.832E+02 1.821E+02 1.724E+02 1.641E+02 1.375E+02 1.217E+02 1.112E+02 9.495E+01 8.300E+01 6.465E+01 4.696E+01 3.079E+01
                2.336E+01 1.961E+01 1.784E+01 1.566E+01 1.459E+01 1.275E+01 1.077E+01 6.559E+00 2.443E+00 8.733E-01
BWR 22500.  3.12  6.223E+03 3.180E+03 1.988E+03 1.419E+03 1.133E+03 9.734E+02 8.795E+02 8.185E+02 7.755E+02 7.442E+02 7.166E+02 6.947E+02 6.758E+02 6.591E+02 6.454E+02 6.302E+02 6.171E+02 6.047E+02 5.931E+02 5.831E+02
                5.711E+02 5.608E+02 5.509E+02 5.413E+02 5.320E+02 5.229E+02 5.142E+02 5.056E+02 4.972E+02 4.901E+02 4.815E+02 4.736E+02 4.662E+02 4.589E+02 4.514E+02 4.443E+02 4.374E+02 4.306E+02 4.240E+02 4.178E+02
                4.112E+02 4.051E+02 3.990E+02 3.931E+02 3.873E+02 3.816E+02 3.760E+02 3.706E+02 3.653E+02 3.611E+02 3.555E+02 3.504E+02 3.455E+02 3.407E+02 3.360E+02 3.315E+02 3.270E+02 3.226E+02 3.183E+02 3.141E+02
                3.100E+02 3.059E+02 3.019E+02 2.981E+02 2.943E+02 2.906E+02 2.869E+02 2.833E+02 2.798E+02 2.764E+02 2.731E+02 2.698E+02 2.666E+02 2.634E+02 2.603E+02 2.573E+02 2.543E+02 2.514E+02 2.486E+02 2.458E+02
                2.431E+02 2.404E+02 2.378E+02 2.352E+02 2.327E+02 2.302E+02 2.278E+02 2.255E+02 2.231E+02 2.209E+02 2.186E+02 2.165E+02 2.143E+02 2.122E+02 2.102E+02 2.082E+02 2.062E+02 2.043E+02 2.024E+02 2.012E+02
                1.991E+02 1.972E+02 1.954E+02 1.937E+02 1.920E+02 1.904E+02 1.888E+02 1.872E+02 1.856E+02 1.841E+02 1.826E+02 1.812E+02 1.797E+02 1.783E+02 1.770E+02 1.756E+02 1.743E+02 1.730E+02 1.717E+02 1.704E+02
                1.692E+02 1.680E+02 1.668E+02 1.656E+02 1.645E+02 1.634E+02 1.623E+02 1.612E+02 1.601E+02 1.591E+02 1.497E+02 1.418E+02 1.170E+02 1.031E+02 9.418E+01 8.062E+01 7.075E+01 5.554E+01 4.082E+01 2.738E+01
                2.115E+01 1.798E+01 1.630E+01 1.457E+01 1.362E+01 1.193E+01 1.012E+01 6.234E+00 2.365E+00 8.640E-01
BWR 30000.  2.23  8.221E+03 4.433E+03 2.877E+03 2.109E+03 1.706E+03 1.467E+03 1.322E+03 1.224E+03 1.154E+03 1.105E+03 1.060E+03 1.024E+03 9.939E+02 9.671E+02 9.454E+02 9.206E+02 9.008E+02 8.814E+02 8.636E+02 8.492E+02
                8.309E+02 8.152E+02 8.008E+02 7.859E+02 7.721E+02 7.586E+02 7.456E+02 7.330E+02 7.207E+02 7.107E+02 6.977E+02 6.862E+02 6.750E+02 6.663E+02 6.538E+02 6.436E+02 6.337E+02 6.240E+02 6.145E+02 6.052E+02
                5.962E+02 5.873E+02 5.787E+02 5.703E+02 5.620E+02 5.540E+02 5.461E+02 5.384E+02 5.309E+02 5.253E+02 5.166E+02 5.094E+02 5.025E+02 4.958E+02 4.892E+02 4.828E+02 4.766E+02 4.704E+02 4.644E+02 4.585E+02
                4.528E+02 4.472E+02 4.416E+02 4.362E+02 4.310E+02 4.258E+02 4.207E+02 4.158E+02 4.109E+02 4.061E+02 4.015E+02 3.969E+02 3.925E+02 3.881E+02 3.838E+02 3.796E+02 3.755E+02 3.715E+02 3.675E+02 3.636E+02
                3.599E+02 3.561E+02 3.525E+02 3.489E+02 3.455E+02 3.420E+02 3.387E+02 3.354E+02 3.322E+02 3.290E+02 3.259E+02 3.225E+02 3.199E+02 3.170E+02 3.141E+02 3.113E+02 3.086E+02 3.059E+02 3.032E+02 3.021E+02
                2.989E+02 2.962E+02 2.937E+02 2.913E+02 2.889E+02 2.866E+02 2.844E+02 2.821E+02 2.800E+02 2.778E+02 2.757E+02 2.737E+02 2.717E+02 2.697E+02 2.677E+02 2.658E+02 2.639E+02 2.621E+02 2.603E+02 2.585E+02
                2.567E+02 2.550E+02 2.533E+02 2.517E+02 2.501E+02 2.485E+02 2.469E+02 2.453E+02 2.438E+02 2.423E+02 2.287E+02 2.172E+02 1.797E+02 1.571E+02 1.423E+02 1.198E+02 1.041E+02 8.068E+01 5.843E+01 3.828E+01
                2.898E+01 2.426E+01 2.177E+01 1.924E+01 1.790E+01 1.550E+01 1.299E+01 7.674E+00 2.786E+00 1.038E+00
BWR 30000.  2.93  7.694E+03 4.129E+03 2.681E+03 1.969E+03 1.598E+03 1.381E+03 1.248E+03 1.159E+03 1.095E+03 1.050E+03 1.007E+03 9.746E+02 9.465E+02 9.219E+02 9.024E+02 8.789E+02 8.599E+02 8.421E+02 8.254E+02 8.121E+02
                7.945E+02 7.796E+02 7.664E+02 7.518E+02 7.386E+02 7.258E+02 7.133E+02 7.012E+02 6.895E+02 6.802E+02 6.680E+02 6.569E+02 6.462E+02 6.358E+02 6.257E+02 6.159E+02 6.063E+02 5.968E+02 5.877E+02 5.787E+02
                5.699E+02 5.613E+02 5.529E+02 5.447E+02 5.367E+02 5.288E+02 5.212E+02 5.137E+02 5.063E+02 5.006E+02 4.923E+02 4.852E+02 4.785E+02 4.719E+02 4.655E+02 4.592E+02 4.531E+02 4.471E+02 4.412E+02 4.354E+02
                4.298E+02 4.242E+02 4.188E+02 4.135E+02 4.083E+02 4.032E+02 3.983E+02 3.934E+02 3.886E+02 3.839E+02 3.793E+02 3.749E+02 3.705E+02 3.661E+02 3.619E+02 3.578E+02 3.537E+02 3.498E+02 3.459E+02 3.421E+02
                3.383E+02 3.347E+02 3.311E+02 3.276E+02 3.241E+02 3.208E+02 3.175E+02 3.142E+02 3.111E+02 3.079E+02 3.049E+02 3.019E+02 2.990E+02 2.961E+02 2.933E+02 2.905E+02 2.878E+02 2.852E+02 2.826E+02 2.812E+02
                2.783E+02 2.757E+02 2.732E+02 2.708E+02 2.685E+02 2.662E+02 2.640E+02 2.618E+02 2.597E+02 2.576E+02 2.555E+02 2.535E+02 2.515E+02 2.495E+02 2.476E+02 2.457E+02 2.439E+02 2.421E+02 2.403E+02 2.386E+02
                2.369E+02 2.352E+02 2.335E+02 2.319E+02 2.303E+02 2.288E+02 2.272E+02 2.257E+02 2.242E+02 2.228E+02 2.095E+02 1.983E+02 1.624E+02 1.416E+02 1.282E+02 1.082E+02 9.414E+01 7.311E+01 5.331E+01 3.527E+01
                2.693E+01 2.269E+01 2.044E+01 1.813E+01 1.688E+01 1.466E+01 1.231E+01 7.335E+00 2.700E+00 1.019E+00
BWR 30000.  3.63  7.245E+03 3.875E+03 2.521E+03 1.859E+03 1.516E+03 1.317E+03 1.195E+03 1.113E+03 1.054E+03 1.011E+03 9.718E+02 9.412E+02 9.146E+02 8.910E+02 8.719E+02 8.496E+02 8.313E+02 8.140E+02 7.977E+02 7.844E+02
                7.675E+02 7.530E+02 7.391E+02 7.257E+02 7.127E+02 7.001E+02 6.878E+02 6.759E+02 6.642E+02 6.547E+02 6.423E+02 6.313E+02 6.207E+02 6.105E+02 6.005E+02 5.907E+02 5.811E+02 5.718E+02 5.626E+02 5.537E+02
                5.450E+02 5.365E+02 5.281E+02 5.200E+02 5.120E+02 5.042E+02 4.965E+02 4.891E+02 4.817E+02 4.762E+02 4.685E+02 4.615E+02 4.547E+02 4.482E+02 4.418E+02 4.355E+02 4.294E+02 4.234E+02 4.175E+02 4.117E+02
                4.061E+02 4.006E+02 3.952E+02 3.899E+02 3.847E+02 3.796E+02 3.747E+02 3.698E+02 3.651E+02 3.604E+02 3.558E+02 3.514E+02 3.470E+02 3.427E+02 3.385E+02 3.344E+02 3.303E+02 3.264E+02 3.225E+02 3.187E+02
                3.150E+02 3.114E+02 3.078E+02 3.044E+02 3.009E+02 2.976E+02 2.943E+02 2.911E+02 2.880E+02 2.849E+02 2.819E+02 2.789E+02 2.760E+02 2.732E+02 2.704E+02 2.676E+02 2.650E+02 2.623E+02 2.598E+02 2.583E+02
                2.554E+02 2.528E+02 2.504E+02 2.480E+02 2.458E+02 2.436E+02 2.413E+02 2.392E+02 2.371E+02 2.350E+02 2.330E+02 2.310E+02 2.291E+02 2.271E+02 2.253E+02 2.234E+02 2.216E+02 2.199E+02 2.181E+02 2.164E+02
                2.147E+02 2.131E+02 2.115E+02 2.099E+02 2.084E+02 2.068E+02 2.053E+02 2.039E+02 2.024E+02 2.010E+02 1.882E+02 1.774E+02 1.436E+02 1.247E+02 1.129E+02 9.549E+01 8.337E+01 6.511E+01 4.786E+01 3.210E+01
                2.483E+01 2.109E+01 1.910E+01 1.703E+01 1.588E+01 1.382E+01 1.164E+01 7.007E+00 2.621E+00 1.003E+00
BWR 40000.  2.74  1.136E+04 6.579E+03 4.529E+03 3.461E+03 2.880E+03 2.518E+03 2.285E+03 2.121E+03 2.000E+03 1.908E+03 1.829E+03 1.765E+03 1.709E+03 1.659E+03 1.617E+03 1.573E+03 1.536E+03 1.499E+03 1.466E+03 1.437E+03
                1.405E+03 1.375E+03 1.347E+03 1.321E+03 1.295E+03 1.270E+03 1.246E+03 1.222E+03 1.199E+03 1.180E+03 1.157E+03 1.136E+03 1.115E+03 1.096E+03 1.077E+03 1.058E+03 1.040E+03 1.022E+03 1.005E+03 9.884E+02
                9.721E+02 9.562E+02 9.408E+02 9.257E+02 9.110E+02 8.967E+02 8.827E+02 8.691E+02 8.558E+02 8.451E+02 8.308E+02 8.181E+02 8.060E+02 7.942E+02 7.828E+02 7.716E+02 7.607E+02 7.500E+02 7.396E+02 7.295E+02
                7.195E+02 7.098E+02 7.003E+02 6.910E+02 6.819E+02 6.731E+02 6.644E+02 6.559E+02 6.476E+02 6.395E+02 6.316E+02 6.238E+02 6.163E+02 6.088E+02 6.016E+02 5.945E+02 5.875E+02 5.807E+02 5.741E+02 5.676E+02
                5.612E+02 5.550E+02 5.489E+02 5.429E+02 5.370E+02 5.313E+02 5.257E+02 5.202E+02 5.148E+02 5.095E+02 5.044E+02 4.993E+02 4.944E+02 4.895E+02 4.848E+02 4.801E+02 4.755E+02 4.710E+02 4.667E+02 4.624E+02
                4.591E+02 4.546E+02 4.506E+02 4.465E+02 4.426E+02 4.388E+02 4.350E+02 4.313E+02 4.277E+02 4.242E+02 4.207E+02 4.173E+02 4.140E+02 4.107E+02 4.075E+02 4.043E+02 4.012E+02 3.982E+02 3.952E+02 3.922E+02
                3.893E+02 3.865E+02 3.837E+02 3.810E+02 3.783E+02 3.757E+02 3.731E+02 3.705E+02 3.680E+02 3.655E+02 3.430E+02 3.238E+02 2.611E+02 2.229E+02 1.986E+02 1.634E+02 1.403E+02 1.080E+02 7.880E+01 5.248E+01
                4.033E+01 3.405E+01 3.068E+01 2.715E+01 2.529E+01 2.175E+01 1.814E+01 1.052E+01 3.789E+00 1.512E+00
BWR 40000.  3.44  1.075E+04 6.184E+03 4.234E+03 3.233E+03 2.686E+03 2.347E+03 2.130E+03 1.979E+03 1.867E+03 1.784E+03 1.712E+03 1.653E+03 1.602E+03 1.557E+03 1.519E+03 1.479E+03 1.445E+03 1.412E+03 1.382E+03 1.356E+03
                1.327E+03 1.300E+03 1.275E+03 1.250E+03 1.227E+03 1.204E+03 1.182E+03 1.160E+03 1.140E+03 1.122E+03 1.101E+03 1.081E+03 1.063E+03 1.045E+03 1.027E+03 1.010E+03 9.931E+02 9.768E+02 9.609E+02 9.453E+02
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                 9.302E+02 9.154E+02 9.010E+02 8.870E+02 8.732E+02 8.598E+02 8.467E+02 8.340E+02 8.215E+02 8.113E+02 7.971E+02 7.852E+02 7.739E+02 7.627E+02 7.519E+02 7.413E+02 7.310E+02 7.209E+02 7.111E+02 7.014E+02
                 6.920E+02 6.828E+02 6.737E+02 6.649E+02 6.563E+02 6.478E+02 6.395E+02 6.315E+02 6.236E+02 6.158E+02 6.082E+02 6.008E+02 5.935E+02 5.864E+02 5.794E+02 5.726E+02 5.659E+02 5.594E+02 5.530E+02 5.467E+02
                 5.406E+02 5.345E+02 5.286E+02 5.229E+02 5.172E+02 5.117E+02 5.062E+02 5.009E+02 4.957E+02 4.906E+02 4.856E+02 4.807E+02 4.759E+02 4.712E+02 4.665E+02 4.620E+02 4.576E+02 4.532E+02 4.489E+02 4.469E+02
                 4.418E+02 4.375E+02 4.334E+02 4.295E+02 4.257E+02 4.219E+02 4.183E+02 4.147E+02 4.112E+02 4.077E+02 4.043E+02 4.010E+02 3.977E+02 3.945E+02 3.913E+02 3.882E+02 3.852E+02 3.822E+02 3.793E+02 3.764E+02
                 3.736E+02 3.708E+02 3.680E+02 3.654E+02 3.627E+02 3.601E+02 3.576E+02 3.551E+02 3.526E+02 3.502E+02 3.281E+02 3.093E+02 2.478E+02 2.110E+02 1.876E+02 1.542E+02 1.324E+02 1.020E+02 7.443E+01 4.962E+01
                 3.821E+01 3.232E+01 2.915E+01 2.584E+01 2.405E+01 2.074E+01 1.733E+01 1.013E+01 3.699E+00 1.495E+00
BWR 40000.   4.14 1.018E+04 5.827E+03 3.981E+03 3.037E+03 2.526E+03 2.208E+03 2.007E+03 1.866E+03 1.763E+03 1.687E+03 1.618E+03 1.563E+03 1.516E+03 1.475E+03 1.442E+03 1.401E+03 1.370E+03 1.340E+03 1.312E+03 1.291E+03
                 1.262E+03 1.238E+03 1.214E+03 1.191E+03 1.169E+03 1.148E+03 1.127E+03 1.107E+03 1.088E+03 1.071E+03 1.051E+03 1.033E+03 1.015E+03 9.981E+02 9.815E+02 9.652E+02 9.494E+02 9.340E+02 9.189E+02 9.042E+02
                 8.898E+02 8.758E+02 8.621E+02 8.487E+02 8.357E+02 8.229E+02 8.104E+02 7.982E+02 7.863E+02 7.770E+02 7.636E+02 7.522E+02 7.412E+02 7.306E+02 7.202E+02 7.101E+02 7.001E+02 6.904E+02 6.809E+02 6.716E+02
                 6.626E+02 6.537E+02 6.449E+02 6.364E+02 6.281E+02 6.199E+02 6.119E+02 6.041E+02 5.964E+02 5.889E+02 5.815E+02 5.743E+02 5.673E+02 5.604E+02 5.536E+02 5.470E+02 5.405E+02 5.342E+02 5.279E+02 5.218E+02
                 5.159E+02 5.100E+02 5.043E+02 4.987E+02 4.932E+02 4.878E+02 4.825E+02 4.773E+02 4.722E+02 4.672E+02 4.623E+02 4.576E+02 4.529E+02 4.483E+02 4.438E+02 4.393E+02 4.350E+02 4.308E+02 4.266E+02 4.244E+02
                 4.196E+02 4.154E+02 4.114E+02 4.076E+02 4.039E+02 4.002E+02 3.967E+02 3.932E+02 3.897E+02 3.863E+02 3.830E+02 3.798E+02 3.766E+02 3.734E+02 3.704E+02 3.673E+02 3.644E+02 3.615E+02 3.586E+02 3.558E+02
                 3.530E+02 3.503E+02 3.476E+02 3.450E+02 3.424E+02 3.399E+02 3.374E+02 3.350E+02 3.326E+02 3.302E+02 3.087E+02 2.904E+02 2.311E+02 1.963E+02 1.746E+02 1.434E+02 1.233E+02 9.519E+01 6.963E+01 4.666E+01
                 3.605E+01 3.057E+01 2.763E+01 2.454E+01 2.287E+01 1.975E+01 1.654E+01 9.742E+00 3.603E+00 1.469E+00
BWR 50000.   3.04 1.173E+04 6.986E+03 4.946E+03 3.875E+03 3.280E+03 2.899E+03 2.647E+03 2.467E+03 2.331E+03 2.227E+03 2.136E+03 2.061E+03 1.996E+03 1.937E+03 1.887E+03 1.834E+03 1.789E+03 1.747E+03 1.708E+03 1.674E+03
                 1.635E+03 1.600E+03 1.566E+03 1.534E+03 1.503E+03 1.473E+03 1.444E+03 1.416E+03 1.389E+03 1.365E+03 1.338E+03 1.313E+03 1.288E+03 1.265E+03 1.242E+03 1.220E+03 1.198E+03 1.177E+03 1.157E+03 1.137E+03
                 1.118E+03 1.099E+03 1.080E+03 1.062E+03 1.045E+03 1.028E+03 1.011E+03 9.953E+02 9.795E+02 9.668E+02 9.501E+02 9.350E+02 9.207E+02 9.068E+02 8.932E+02 8.800E+02 8.671E+02 8.546E+02 8.423E+02 8.305E+02
                 8.186E+02 8.071E+02 7.959E+02 7.850E+02 7.743E+02 7.639E+02 7.537E+02 7.437E+02 7.340E+02 7.245E+02 7.152E+02 7.061E+02 6.972E+02 6.885E+02 6.800E+02 6.717E+02 6.635E+02 6.556E+02 6.478E+02 6.402E+02
                 6.327E+02 6.254E+02 6.183E+02 6.113E+02 6.045E+02 5.978E+02 5.912E+02 5.848E+02 5.785E+02 5.723E+02 5.663E+02 5.604E+02 5.546E+02 5.490E+02 5.434E+02 5.380E+02 5.326E+02 5.274E+02 5.223E+02 5.197E+02
                 5.136E+02 5.084E+02 5.035E+02 4.989E+02 4.943E+02 4.899E+02 4.855E+02 4.812E+02 4.770E+02 4.729E+02 4.689E+02 4.649E+02 4.610E+02 4.572E+02 4.534E+02 4.498E+02 4.461E+02 4.426E+02 4.391E+02 4.357E+02
                 4.323E+02 4.290E+02 4.258E+02 4.226E+02 4.195E+02 4.164E+02 4.134E+02 4.104E+02 4.075E+02 4.046E+02 3.784E+02 3.561E+02 2.830E+02 2.387E+02 2.108E+02 1.715E+02 1.467E+02 1.125E+02 8.301E+01 5.620E+01
                 4.380E+01 3.730E+01 3.376E+01 2.994E+01 2.788E+01 2.389E+01 1.984E+01 1.134E+01 4.048E+00 1.675E+00
BWR 50000.   3.74 1.113E+04 6.581E+03 4.638E+03 3.623E+03 3.060E+03 2.702E+03 2.467E+03 2.299E+03 2.174E+03 2.080E+03 1.997E+03 1.928E+03 1.868E+03 1.815E+03 1.769E+03 1.722E+03 1.681E+03 1.643E+03 1.607E+03 1.577E+03
                 1.542E+03 1.510E+03 1.480E+03 1.451E+03 1.423E+03 1.396E+03 1.369E+03 1.344E+03 1.319E+03 1.297E+03 1.272E+03 1.249E+03 1.227E+03 1.205E+03 1.184E+03 1.164E+03 1.144E+03 1.125E+03 1.106E+03 1.088E+03
                 1.070E+03 1.052E+03 1.035E+03 1.018E+03 1.002E+03 9.864E+02 9.709E+02 9.558E+02 9.411E+02 9.293E+02 9.127E+02 8.986E+02 8.852E+02 8.721E+02 8.594E+02 8.470E+02 8.349E+02 8.230E+02 8.114E+02 8.001E+02
                 7.891E+02 7.782E+02 7.676E+02 7.573E+02 7.472E+02 7.373E+02 7.276E+02 7.181E+02 7.089E+02 6.998E+02 6.909E+02 6.822E+02 6.737E+02 6.654E+02 6.573E+02 6.493E+02 6.415E+02 6.339E+02 6.264E+02 6.191E+02
                 6.119E+02 6.049E+02 5.980E+02 5.913E+02 5.847E+02 5.783E+02 5.719E+02 5.657E+02 5.597E+02 5.537E+02 5.479E+02 5.422E+02 5.366E+02 5.311E+02 5.257E+02 5.204E+02 5.152E+02 5.102E+02 5.052E+02 5.028E+02
                 4.969E+02 4.919E+02 4.871E+02 4.826E+02 4.781E+02 4.738E+02 4.695E+02 4.654E+02 4.613E+02 4.572E+02 4.533E+02 4.494E+02 4.456E+02 4.419E+02 4.382E+02 4.346E+02 4.310E+02 4.276E+02 4.241E+02 4.208E+02
                 4.175E+02 4.143E+02 4.111E+02 4.079E+02 4.049E+02 4.018E+02 3.989E+02 3.960E+02 3.931E+02 3.903E+02 3.645E+02 3.426E+02 2.707E+02 2.276E+02 2.008E+02 1.629E+02 1.392E+02 1.071E+02 7.874E+01 5.335E+01
                 4.159E+01 3.545E+01 3.210E+01 2.851E+01 2.653E+01 2.280E+01 1.896E+01 1.093E+01 3.958E+00 1.660E+00
BWR 50000.   4.44 1.055E+04 6.206E+03 4.362E+03 3.404E+03 2.874E+03 2.537E+03 2.317E+03 2.162E+03 2.045E+03 1.959E+03 1.880E+03 1.816E+03 1.761E+03 1.713E+03 1.674E+03 1.627E+03 1.590E+03 1.555E+03 1.522E+03 1.496E+03
                 1.463E+03 1.433E+03 1.405E+03 1.378E+03 1.352E+03 1.327E+03 1.303E+03 1.279E+03 1.256E+03 1.237E+03 1.213E+03 1.191E+03 1.170E+03 1.150E+03 1.131E+03 1.111E+03 1.093E+03 1.075E+03 1.057E+03 1.040E+03
                 1.023E+03 1.006E+03 9.903E+02 9.746E+02 9.593E+02 9.443E+02 9.297E+02 9.154E+02 9.014E+02 8.906E+02 8.750E+02 8.616E+02 8.488E+02 8.363E+02 8.242E+02 8.124E+02 8.008E+02 7.895E+02 7.784E+02 7.676E+02
                 7.569E+02 7.466E+02 7.364E+02 7.265E+02 7.168E+02 7.073E+02 6.980E+02 6.888E+02 6.799E+02 6.712E+02 6.626E+02 6.543E+02 6.461E+02 6.381E+02 6.302E+02 6.225E+02 6.150E+02 6.076E+02 6.004E+02 5.933E+02
                 5.863E+02 5.795E+02 5.729E+02 5.664E+02 5.600E+02 5.537E+02 5.476E+02 5.416E+02 5.357E+02 5.299E+02 5.242E+02 5.187E+02 5.132E+02 5.079E+02 5.026E+02 4.975E+02 4.925E+02 4.876E+02 4.827E+02 4.802E+02
                 4.745E+02 4.696E+02 4.650E+02 4.605E+02 4.562E+02 4.520E+02 4.478E+02 4.437E+02 4.398E+02 4.358E+02 4.320E+02 4.282E+02 4.245E+02 4.208E+02 4.173E+02 4.137E+02 4.103E+02 4.069E+02 4.036E+02 4.003E+02
                 3.971E+02 3.939E+02 3.908E+02 3.878E+02 3.848E+02 3.818E+02 3.789E+02 3.761E+02 3.733E+02 3.705E+02 3.454E+02 3.241E+02 2.546E+02 2.136E+02 1.882E+02 1.528E+02 1.306E+02 1.006E+02 7.408E+01 5.031E+01
                 3.934E+01 3.360E+01 3.048E+01 2.711E+01 2.523E+01 2.173E+01 1.811E+01 1.052E+01 3.858E+00 1.632E+00
PWR 10000.    .99 5.071E+03 2.334E+03 1.321E+03 8.481E+02 6.203E+02 5.021E+02 4.380E+02 4.001E+02 3.758E+02 3.598E+02 3.458E+02 3.356E+02 3.272E+02 3.198E+02 3.140E+02 3.075E+02 3.021E+02 2.972E+02 2.925E+02 2.886E+02
                 2.838E+02 2.798E+02 2.760E+02 2.723E+02 2.688E+02 2.654E+02 2.621E+02 2.588E+02 2.557E+02 2.530E+02 2.498E+02 2.468E+02 2.439E+02 2.411E+02 2.384E+02 2.357E+02 2.331E+02 2.306E+02 2.280E+02 2.255E+02
                 2.231E+02 2.207E+02 2.183E+02 2.160E+02 2.138E+02 2.116E+02 2.094E+02 2.072E+02 2.051E+02 2.035E+02 2.010E+02 1.991E+02 1.971E+02 1.952E+02 1.934E+02 1.915E+02 1.897E+02 1.880E+02 1.862E+02 1.845E+02
                 1.829E+02 1.812E+02 1.796E+02 1.780E+02 1.764E+02 1.749E+02 1.734E+02 1.719E+02 1.705E+02 1.690E+02 1.676E+02 1.663E+02 1.649E+02 1.636E+02 1.623E+02 1.610E+02 1.597E+02 1.585E+02 1.573E+02 1.561E+02
                 1.549E+02 1.538E+02 1.526E+02 1.515E+02 1.504E+02 1.494E+02 1.483E+02 1.473E+02 1.463E+02 1.453E+02 1.443E+02 1.434E+02 1.424E+02 1.415E+02 1.406E+02 1.397E+02 1.388E+02 1.380E+02 1.371E+02 1.368E+02
                 1.357E+02 1.349E+02 1.341E+02 1.333E+02 1.326E+02 1.318E+02 1.311E+02 1.304E+02 1.297E+02 1.290E+02 1.283E+02 1.277E+02 1.270E+02 1.264E+02 1.257E+02 1.251E+02 1.245E+02 1.239E+02 1.233E+02 1.227E+02
                 1.221E+02 1.216E+02 1.210E+02 1.205E+02 1.200E+02 1.194E+02 1.189E+02 1.184E+02 1.179E+02 1.174E+02 1.129E+02 1.090E+02 9.569E+01 8.714E+01 8.081E+01 7.041E+01 6.212E+01 4.905E+01 3.605E+01 2.414E+01
                 1.864E+01 1.586E+01 1.440E+01 1.292E+01 1.211E+01 1.071E+01 9.161E+00 5.782E+00 2.170E+00 6.615E-01
PWR 10000.    1.69 4.603E+03 2.065E+03 1.166E+03 7.542E+02 5.589E+02 4.580E+02 4.038E+02 3.716E+02 3.506E+02 3.359E+02 3.236E+02 3.140E+02 3.057E+02 2.984E+02 2.921E+02 2.856E+02 2.800E+02 2.747E+02 2.697E+02 2.652E+02
                 2.602E+02 2.559E+02 2.517E+02 2.477E+02 2.438E+02 2.400E+02 2.363E+02 2.327E+02 2.292E+02 2.261E+02 2.225E+02 2.193E+02 2.161E+02 2.130E+02 2.100E+02 2.071E+02 2.042E+02 2.013E+02 1.986E+02 1.959E+02
                 1.932E+02 1.906E+02 1.881E+02 1.856E+02 1.831E+02 1.808E+02 1.784E+02 1.761E+02 1.739E+02 1.720E+02 1.696E+02 1.675E+02 1.654E+02 1.634E+02 1.614E+02 1.595E+02 1.576E+02 1.557E+02 1.539E+02 1.521E+02
                 1.504E+02 1.486E+02 1.469E+02 1.453E+02 1.437E+02 1.421E+02 1.406E+02 1.390E+02 1.375E+02 1.360E+02 1.346E+02 1.332E+02 1.318E+02 1.304E+02 1.291E+02 1.278E+02 1.265E+02 1.253E+02 1.241E+02 1.229E+02
                 1.217E+02 1.205E+02 1.194E+02 1.183E+02 1.172E+02 1.161E+02 1.151E+02 1.141E+02 1.131E+02 1.121E+02 1.111E+02 1.102E+02 1.092E+02 1.083E+02 1.074E+02 1.066E+02 1.057E+02 1.049E+02 1.041E+02 1.035E+02
                 1.026E+02 1.018E+02 1.010E+02 1.003E+02 9.956E+01 9.884E+01 9.814E+01 9.746E+01 9.678E+01 9.612E+01 9.548E+01 9.484E+01 9.422E+01 9.361E+01 9.301E+01 9.242E+01 9.184E+01 9.127E+01 9.072E+01 9.017E+01
                 8.963E+01 8.911E+01 8.859E+01 8.809E+01 8.759E+01 8.710E+01 8.662E+01 8.615E+01 8.569E+01 8.523E+01 8.112E+01 7.766E+01 6.662E+01 6.027E+01 5.594E+01 4.902E+01 4.365E+01 3.513E+01 2.666E+01 1.884E+01
                 1.520E+01 1.330E+01 1.228E+01 1.117E+01 1.053E+01 9.373E+00 8.069E+00 5.194E+00 2.005E+00 6.355E-01
PWR 10000.    2.39 4.390E+03 1.934E+03 1.090E+03 7.079E+02 5.297E+02 4.383E+02 3.894E+02 3.601E+02 3.406E+02 3.268E+02 3.150E+02 3.054E+02 2.971E+02 2.896E+02 2.831E+02 2.762E+02 2.702E+02 2.646E+02 2.592E+02 2.546E+02
                 2.489E+02 2.442E+02 2.397E+02 2.354E+02 2.312E+02 2.271E+02 2.231E+02 2.192E+02 2.154E+02 2.121E+02 2.082E+02 2.046E+02 2.012E+02 1.979E+02 1.946E+02 1.914E+02 1.883E+02 1.852E+02 1.822E+02 1.793E+02
                 1.765E+02 1.737E+02 1.710E+02 1.683E+02 1.657E+02 1.631E+02 1.606E+02 1.582E+02 1.558E+02 1.538E+02 1.511E+02 1.488E+02 1.467E+02 1.445E+02 1.424E+02 1.404E+02 1.384E+02 1.365E+02 1.345E+02 1.327E+02
                 1.308E+02 1.290E+02 1.273E+02 1.255E+02 1.239E+02 1.222E+02 1.206E+02 1.190E+02 1.175E+02 1.159E+02 1.145E+02 1.130E+02 1.116E+02 1.102E+02 1.088E+02 1.075E+02 1.062E+02 1.049E+02 1.036E+02 1.024E+02
                 1.012E+02 1.000E+02 9.888E+01 9.775E+01 9.665E+01 9.557E+01 9.451E+01 9.347E+01 9.246E+01 9.147E+01 9.049E+01 8.954E+01 8.861E+01 8.770E+01 8.680E+01 8.593E+01 8.507E+01 8.423E+01 8.341E+01 8.283E+01
                 8.192E+01 8.114E+01 8.039E+01 7.965E+01 7.892E+01 7.821E+01 7.752E+01 7.684E+01 7.617E+01 7.552E+01 7.488E+01 7.426E+01 7.364E+01 7.304E+01 7.245E+01 7.188E+01 7.131E+01 7.076E+01 7.021E+01 6.968E+01
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                6.916E+01 6.865E+01 6.815E+01 6.766E+01 6.718E+01 6.671E+01 6.624E+01 6.579E+01 6.535E+01 6.491E+01 6.100E+01 5.776E+01 4.802E+01 4.299E+01 3.990E+01 3.521E+01 3.162E+01 2.594E+01 2.030E+01 1.505E+01
                1.259E+01 1.126E+01 1.052E+01 9.680E+00 9.163E+00 8.194E+00 7.111E+00 4.664E+00 1.859E+00 6.278E-01
PWR 20000.   1.74 7.430E+03 3.679E+03 2.197E+03 1.492E+03 1.140E+03 9.482E+02 8.388E+02 7.704E+02 7.239E+02 6.915E+02 6.633E+02 6.418E+02 6.237E+02 6.078E+02 5.953E+02 5.810E+02 5.691E+02 5.581E+02 5.477E+02 5.398E+02
                5.285E+02 5.195E+02 5.109E+02 5.027E+02 4.948E+02 4.871E+02 4.796E+02 4.723E+02 4.652E+02 4.596E+02 4.524E+02 4.458E+02 4.394E+02 4.331E+02 4.271E+02 4.211E+02 4.153E+02 4.097E+02 4.041E+02 3.987E+02
                3.934E+02 3.882E+02 3.831E+02 3.781E+02 3.733E+02 3.685E+02 3.638E+02 3.592E+02 3.547E+02 3.512E+02 3.460E+02 3.418E+02 3.377E+02 3.337E+02 3.297E+02 3.259E+02 3.221E+02 3.184E+02 3.148E+02 3.112E+02
                3.077E+02 3.043E+02 3.009E+02 2.976E+02 2.944E+02 2.912E+02 2.881E+02 2.851E+02 2.821E+02 2.792E+02 2.763E+02 2.735E+02 2.708E+02 2.681E+02 2.654E+02 2.628E+02 2.603E+02 2.578E+02 2.553E+02 2.529E+02
                2.505E+02 2.483E+02 2.460E+02 2.438E+02 2.416E+02 2.395E+02 2.374E+02 2.353E+02 2.333E+02 2.314E+02 2.294E+02 2.275E+02 2.257E+02 2.238E+02 2.220E+02 2.203E+02 2.186E+02 2.169E+02 2.152E+02 2.143E+02
                2.125E+02 2.109E+02 2.093E+02 2.078E+02 2.063E+02 2.048E+02 2.034E+02 2.020E+02 2.006E+02 1.993E+02 1.980E+02 1.967E+02 1.954E+02 1.942E+02 1.929E+02 1.917E+02 1.905E+02 1.894E+02 1.882E+02 1.871E+02
                1.860E+02 1.849E+02 1.838E+02 1.828E+02 1.818E+02 1.808E+02 1.798E+02 1.788E+02 1.778E+02 1.769E+02 1.683E+02 1.610E+02 1.370E+02 1.225E+02 1.125E+02 9.680E+01 8.488E+01 6.640E+01 4.838E+01 3.189E+01
                2.429E+01 2.045E+01 1.843E+01 1.640E+01 1.529E+01 1.338E+01 1.132E+01 6.909E+00 2.545E+00 8.504E-01
PWR 20000.   2.44 6.974E+03 3.421E+03 2.045E+03 1.396E+03 1.077E+03 9.033E+02 8.047E+02 7.428E+02 7.004E+02 6.707E+02 6.446E+02 6.242E+02 6.067E+02 5.913E+02 5.786E+02 5.669E+02 5.530E+02 5.420E+02 5.315E+02 5.225E+02
                5.120E+02 5.029E+02 4.941E+02 4.857E+02 4.775E+02 4.696E+02 4.619E+02 4.544E+02 4.471E+02 4.408E+02 4.333E+02 4.265E+02 4.199E+02 4.135E+02 4.072E+02 4.011E+02 3.951E+02 3.892E+02 3.835E+02 3.779E+02
                3.724E+02 3.670E+02 3.618E+02 3.566E+02 3.516E+02 3.467E+02 3.419E+02 3.371E+02 3.325E+02 3.288E+02 3.239E+02 3.196E+02 3.153E+02 3.112E+02 3.071E+02 3.031E+02 2.992E+02 2.954E+02 2.917E+02 2.880E+02
                2.844E+02 2.809E+02 2.774E+02 2.741E+02 2.708E+02 2.675E+02 2.643E+02 2.612E+02 2.582E+02 2.552E+02 2.523E+02 2.494E+02 2.466E+02 2.438E+02 2.411E+02 2.385E+02 2.359E+02 2.334E+02 2.309E+02 2.285E+02
                2.261E+02 2.237E+02 2.214E+02 2.192E+02 2.170E+02 2.148E+02 2.127E+02 2.106E+02 2.086E+02 2.066E+02 2.047E+02 2.028E+02 2.009E+02 1.991E+02 1.973E+02 1.955E+02 1.938E+02 1.921E+02 1.904E+02 1.894E+02
                1.875E+02 1.859E+02 1.843E+02 1.828E+02 1.814E+02 1.799E+02 1.785E+02 1.771E+02 1.757E+02 1.744E+02 1.731E+02 1.718E+02 1.705E+02 1.693E+02 1.681E+02 1.669E+02 1.657E+02 1.646E+02 1.635E+02 1.623E+02
                1.613E+02 1.602E+02 1.592E+02 1.581E+02 1.571E+02 1.561E+02 1.552E+02 1.542E+02 1.533E+02 1.524E+02 1.440E+02 1.370E+02 1.148E+02 1.021E+02 9.376E+01 8.086E+01 7.117E+01 5.615E+01 4.148E+01 2.804E+01
                2.180E+01 1.861E+01 1.692E+01 1.516E+01 1.419E+01 1.245E+01 1.058E+01 6.536E+00 2.452E+00 8.369E-01
PWR 20000.   3.14 6.634E+03 3.223E+03 1.929E+03 1.324E+03 1.030E+03 8.700E+02 7.798E+02 7.229E+02 6.836E+02 6.554E+02 6.308E+02 6.111E+02 5.940E+02 5.788E+02 5.658E+02 5.522E+02 5.403E+02 5.290E+02 5.184E+02 5.088E+02
                4.982E+02 4.889E+02 4.798E+02 4.711E+02 4.627E+02 4.544E+02 4.465E+02 4.387E+02 4.311E+02 4.243E+02 4.167E+02 4.097E+02 4.028E+02 3.961E+02 3.896E+02 3.833E+02 3.770E+02 3.709E+02 3.650E+02 3.592E+02
                3.535E+02 3.479E+02 3.425E+02 3.372E+02 3.320E+02 3.269E+02 3.219E+02 3.170E+02 3.122E+02 3.082E+02 3.031E+02 2.986E+02 2.943E+02 2.900E+02 2.858E+02 2.817E+02 2.777E+02 2.738E+02 2.699E+02 2.662E+02
                2.625E+02 2.589E+02 2.554E+02 2.519E+02 2.485E+02 2.452E+02 2.420E+02 2.388E+02 2.357E+02 2.326E+02 2.297E+02 2.267E+02 2.239E+02 2.211E+02 2.184E+02 2.157E+02 2.130E+02 2.105E+02 2.079E+02 2.055E+02
                2.031E+02 2.007E+02 1.984E+02 1.961E+02 1.939E+02 1.917E+02 1.896E+02 1.875E+02 1.855E+02 1.835E+02 1.815E+02 1.796E+02 1.777E+02 1.759E+02 1.740E+02 1.723E+02 1.706E+02 1.689E+02 1.672E+02 1.661E+02
                1.642E+02 1.626E+02 1.611E+02 1.596E+02 1.581E+02 1.567E+02 1.553E+02 1.539E+02 1.525E+02 1.512E+02 1.499E+02 1.486E+02 1.474E+02 1.462E+02 1.450E+02 1.438E+02 1.427E+02 1.415E+02 1.404E+02 1.394E+02
                1.383E+02 1.372E+02 1.362E+02 1.352E+02 1.342E+02 1.333E+02 1.323E+02 1.314E+02 1.305E+02 1.296E+02 1.216E+02 1.149E+02 9.428E+01 8.333E+01 7.645E+01 6.611E+01 5.849E+01 4.662E+01 3.502E+01 2.433E+01
                1.938E+01 1.680E+01 1.541E+01 1.392E+01 1.306E+01 1.150E+01 9.817E+00 6.148E+00 2.358E+00 8.302E-01
PWR 30000.   2.41 9.270E+03 4.848E+03 3.044E+03 2.164E+03 1.709E+03 1.449E+03 1.294E+03 1.192E+03 1.120E+03 1.068E+03 1.022E+03 9.867E+02 9.566E+02 9.302E+02 9.094E+02 8.847E+02 8.648E+02 8.463E+02 8.289E+02 8.148E+02
                7.974E+02 7.822E+02 7.677E+02 7.538E+02 7.403E+02 7.273E+02 7.146E+02 7.024E+02 6.905E+02 6.804E+02 6.681E+02 6.570E+02 6.462E+02 6.358E+02 6.257E+02 6.158E+02 6.062E+02 5.968E+02 5.876E+02 5.786E+02
                5.699E+02 5.613E+02 5.530E+02 5.448E+02 5.368E+02 5.290E+02 5.214E+02 5.139E+02 5.066E+02 5.008E+02 4.925E+02 4.855E+02 4.789E+02 4.724E+02 4.660E+02 4.598E+02 4.537E+02 4.478E+02 4.419E+02 4.362E+02
                4.306E+02 4.252E+02 4.198E+02 4.146E+02 4.094E+02 4.044E+02 3.995E+02 3.946E+02 3.899E+02 3.853E+02 3.807E+02 3.763E+02 3.720E+02 3.677E+02 3.635E+02 3.594E+02 3.554E+02 3.515E+02 3.477E+02 3.439E+02
                3.402E+02 3.366E+02 3.331E+02 3.296E+02 3.262E+02 3.229E+02 3.196E+02 3.164E+02 3.133E+02 3.102E+02 3.072E+02 3.043E+02 3.014E+02 2.986E+02 2.958E+02 2.931E+02 2.904E+02 2.878E+02 2.852E+02 2.838E+02
                2.808E+02 2.783E+02 2.759E+02 2.735E+02 2.712E+02 2.690E+02 2.668E+02 2.647E+02 2.626E+02 2.605E+02 2.585E+02 2.565E+02 2.545E+02 2.526E+02 2.507E+02 2.489E+02 2.471E+02 2.453E+02 2.435E+02 2.418E+02
                2.401E+02 2.385E+02 2.369E+02 2.353E+02 2.337E+02 2.322E+02 2.306E+02 2.292E+02 2.277E+02 2.263E+02 2.133E+02 2.023E+02 1.670E+02 1.465E+02 1.331E+02 1.129E+02 9.863E+01 7.710E+01 5.656E+01 3.784E+01
                2.917E+01 2.472E+01 2.235E+01 1.987E+01 1.851E+01 1.606E+01 1.347E+01 7.995E+00 2.898E+00 1.036E+00
PWR 30000.   3.11 8.728E+03 4.536E+03 2.860E+03 2.033E+03 1.615E+03 1.377E+03 1.235E+03 1.142E+03 1.076E+03 1.028E+03 9.859E+02 9.528E+02 9.244E+02 8.994E+02 8.789E+02 8.563E+02 8.371E+02 8.192E+02 8.023E+02 7.881E+02
                7.709E+02 7.562E+02 7.420E+02 7.284E+02 7.152E+02 7.025E+02 6.901E+02 6.780E+02 6.663E+02 6.565E+02 6.442E+02 6.332E+02 6.227E+02 6.124E+02 6.024E+02 5.926E+02 5.830E+02 5.737E+02 5.646E+02 5.557E+02
                5.470E+02 5.385E+02 5.302E+02 5.221E+02 5.142E+02 5.064E+02 4.988E+02 4.914E+02 4.841E+02 4.785E+02 4.708E+02 4.639E+02 4.573E+02 4.508E+02 4.444E+02 4.382E+02 4.321E+02 4.261E+02 4.203E+02 4.146E+02
                4.090E+02 4.035E+02 3.982E+02 3.929E+02 3.878E+02 3.827E+02 3.778E+02 3.730E+02 3.683E+02 3.636E+02 3.591E+02 3.547E+02 3.503E+02 3.461E+02 3.419E+02 3.378E+02 3.338E+02 3.299E+02 3.261E+02 3.223E+02
                3.187E+02 3.151E+02 3.115E+02 3.081E+02 3.047E+02 3.014E+02 2.981E+02 2.949E+02 2.918E+02 2.887E+02 2.857E+02 2.828E+02 2.799E+02 2.771E+02 2.744E+02 2.716E+02 2.690E+02 2.664E+02 2.638E+02 2.624E+02
                2.595E+02 2.570E+02 2.546E+02 2.523E+02 2.500E+02 2.478E+02 2.456E+02 2.435E+02 2.414E+02 2.394E+02 2.373E+02 2.354E+02 2.334E+02 2.315E+02 2.297E+02 2.279E+02 2.261E+02 2.243E+02 2.226E+02 2.209E+02
                2.193E+02 2.176E+02 2.160E+02 2.145E+02 2.129E+02 2.114E+02 2.099E+02 2.085E+02 2.070E+02 2.056E+02 1.929E+02 1.822E+02 1.486E+02 1.298E+02 1.179E+02 1.002E+02 8.775E+01 6.888E+01 5.095E+01 3.455E+01
                2.692E+01 2.299E+01 2.088E+01 1.865E+01 1.739E+01 1.514E+01 1.272E+01 7.631E+00 2.805E+00 1.018E+00
PWR 30000.   3.81 8.281E+03 4.277E+03 2.690E+03 1.926E+03 1.540E+03 1.320E+03 1.190E+03 1.104E+03 1.043E+03 9.992E+02 9.598E+02 9.284E+02 9.012E+02 8.770E+02 8.567E+02 8.350E+02 8.162E+02 7.985E+02 7.818E+02 7.674E+02
                7.507E+02 7.360E+02 7.219E+02 7.083E+02 6.951E+02 6.823E+02 6.699E+02 6.578E+02 6.461E+02 6.359E+02 6.238E+02 6.128E+02 6.022E+02 5.918E+02 5.818E+02 5.719E+02 5.623E+02 5.529E+02 5.437E+02 5.348E+02
                5.260E+02 5.174E+02 5.091E+02 5.009E+02 4.929E+02 4.851E+02 4.774E+02 4.699E+02 4.626E+02 4.567E+02 4.490E+02 4.421E+02 4.354E+02 4.288E+02 4.224E+02 4.162E+02 4.100E+02 4.040E+02 3.982E+02 3.924E+02
                3.868E+02 3.813E+02 3.759E+02 3.706E+02 3.654E+02 3.604E+02 3.554E+02 3.506E+02 3.459E+02 3.412E+02 3.367E+02 3.322E+02 3.279E+02 3.236E+02 3.194E+02 3.153E+02 3.113E+02 3.074E+02 3.036E+02 2.998E+02
                2.961E+02 2.925E+02 2.890E+02 2.855E+02 2.822E+02 2.788E+02 2.756E+02 2.724E+02 2.693E+02 2.663E+02 2.633E+02 2.603E+02 2.575E+02 2.547E+02 2.519E+02 2.492E+02 2.466E+02 2.440E+02 2.415E+02 2.398E+02
                2.370E+02 2.345E+02 2.321E+02 2.299E+02 2.276E+02 2.254E+02 2.233E+02 2.212E+02 2.191E+02 2.171E+02 2.151E+02 2.132E+02 2.112E+02 2.094E+02 2.075E+02 2.058E+02 2.040E+02 2.023E+02 2.006E+02 1.989E+02
                1.973E+02 1.957E+02 1.941E+02 1.926E+02 1.911E+02 1.896E+02 1.881E+02 1.867E+02 1.853E+02 1.840E+02 1.716E+02 1.613E+02 1.295E+02 1.126E+02 1.022E+02 8.710E+01 7.650E+01 6.046E+01 4.517E+01 3.114E+01
                2.463E+01 2.122E+01 1.938E+01 1.740E+01 1.626E+01 1.419E+01 1.198E+01 7.267E+00 2.719E+00 1.005E+00
PWR 40000.   3.02 1.117E+04 6.122E+03 4.016E+03 2.961E+03 2.400E+03 2.063E+03 1.855E+03 1.714E+03 1.612E+03 1.539E+03 1.472E+03 1.420E+03 1.375E+03 1.336E+03 1.305E+03 1.270E+03 1.240E+03 1.213E+03 1.187E+03 1.166E+03
                1.140E+03 1.117E+03 1.096E+03 1.075E+03 1.055E+03 1.036E+03 1.017E+03 9.994E+02 9.818E+02 9.673E+02 9.489E+02 9.325E+02 9.168E+02 9.015E+02 8.867E+02 8.722E+02 8.581E+02 8.443E+02 8.309E+02 8.178E+02
                8.050E+02 7.925E+02 7.804E+02 7.685E+02 7.569E+02 7.455E+02 7.344E+02 7.236E+02 7.130E+02 7.049E+02 6.929E+02 6.828E+02 6.731E+02 6.637E+02 6.545E+02 6.456E+02 6.368E+02 6.282E+02 6.198E+02 6.116E+02
                6.036E+02 5.957E+02 5.880E+02 5.805E+02 5.731E+02 5.659E+02 5.588E+02 5.519E+02 5.452E+02 5.385E+02 5.321E+02 5.257E+02 5.195E+02 5.134E+02 5.075E+02 5.016E+02 4.959E+02 4.903E+02 4.848E+02 4.795E+02
                4.742E+02 4.690E+02 4.640E+02 4.591E+02 4.542E+02 4.495E+02 4.448E+02 4.403E+02 4.358E+02 4.314E+02 4.271E+02 4.229E+02 4.188E+02 4.148E+02 4.108E+02 4.069E+02 4.031E+02 3.994E+02 3.957E+02 3.938E+02
                3.875E+02 3.859E+02 3.824E+02 3.791E+02 3.758E+02 3.726E+02 3.695E+02 3.664E+02 3.634E+02 3.604E+02 3.575E+02 3.547E+02 3.519E+02 3.492E+02 3.465E+02 3.438E+02 3.412E+02 3.387E+02 3.362E+02 3.337E+02
                3.313E+02 3.289E+02 3.266E+02 3.243E+02 3.221E+02 3.198E+02 3.177E+02 3.155E+02 3.134E+02 3.114E+02 2.926E+02 2.767E+02 2.246E+02 1.944E+02 1.747E+02 1.459E+02 1.264E+02 9.819E+01 7.196E+01 4.823E+01
                3.726E+01 3.159E+01 2.856E+01 2.539E+01 2.367E+01 2.049E+01 1.717E+01 1.014E+01 3.685E+00 1.381E+00
PWR 40000.   3.72 1.058E+04 5.771E+03 3.781E+03 2.791E+03 2.265E+03 1.953E+03 1.760E+03 1.630E+03 1.535E+03 1.467E+03 1.406E+03 1.357E+03 1.315E+03 1.279E+03 1.249E+03 1.215E+03 1.188E+03 1.162E+03 1.138E+03 1.118E+03
                1.093E+03 1.072E+03 1.051E+03 1.032E+03 1.013E+03 9.945E+02 9.767E+02 9.595E+02 9.428E+02 9.296E+02 9.122E+02 8.965E+02 8.814E+02 8.668E+02 8.525E+02 8.388E+02 8.250E+02 8.117E+02 7.988E+02 7.862E+02
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		7.738E+02	7.618E+02	7.500E+02	7.385E+02	7.272E+02	7.163E+02	7.055E+02	6.950E+02	6.847E+02	6.746E+02	6.650E+02	6.552E+02	6.458E+02	6.366E+02	6.277E+02	6.190E+02	6.104E+02	6.021E+02	5.939E+02	5.858E+02				
		5.780E+02	5.703E+02	5.628E+02	5.554E+02	5.482E+02	5.412E+02	5.343E+02	5.275E+02	5.209E+02	5.144E+02	5.080E+02	5.018E+02	4.957E+02	4.897E+02	4.839E+02	4.782E+02	4.725E+02	4.671E+02	4.617E+02	4.564E+02				
		4.512E+02	4.462E+02	4.412E+02	4.364E+02	4.316E+02	4.269E+02	4.224E+02	4.179E+02	4.135E+02	4.092E+02	4.050E+02	4.008E+02	3.968E+02	3.928E+02	3.889E+02	3.851E+02	3.814E+02	3.777E+02	3.741E+02	3.720E+02				
		3.680E+02	3.644E+02	3.610E+02	3.577E+02	3.545E+02	3.514E+02	3.483E+02	3.453E+02	3.423E+02	3.394E+02	3.366E+02	3.338E+02	3.310E+02	3.283E+02	3.257E+02	3.231E+02	3.205E+02	3.180E+02	3.156E+02	3.131E+02				
		3.108E+02	3.084E+02	3.062E+02	3.039E+02	3.017E+02	2.995E+02	2.974E+02	2.953E+02	2.933E+02	2.913E+02	2.729E+02	2.574E+02	2.078E+02	1.788E+02	1.606E+02	1.342E+02	1.163E+02	9.061E+01	6.672E+01	4.505E+01				
		3.501E+01	2.982E+01	2.704E+01	2.410E+01	2.248E+01	1.950E+01	1.657E+01	9.752E+00	3.588E+00	1.358E+00														
PWR 40000.	4.42	1.006E+04	5.462E+03	3.580E+03	2.647E+03	2.156E+03	1.866E+03	1.686E+03	1.565E+03	1.477E+03	1.412E+03	1.354E+03	1.308E+03	1.269E+03	1.234E+03	1.206E+03	1.174E+03	1.147E+03	1.123E+03	1.099E+03	1.081E+03				
		1.057E+03	1.036E+03	1.016E+03	9.972E+02	9.789E+02	9.610E+02	9.437E+02	9.269E+02	9.106E+02	8.969E+02	8.797E+02	8.644E+02	8.498E+02	8.353E+02	8.213E+02	8.076E+02	7.943E+02	7.813E+02	7.686E+02	7.561E+02				
		7.440E+02	7.322E+02	7.206E+02	7.092E+02	6.982E+02	6.874E+02	6.768E+02	6.664E+02	6.563E+02	6.485E+02	6.379E+02	6.282E+02	6.189E+02	6.098E+02	6.010E+02	5.923E+02	5.839E+02	5.756E+02	5.675E+02	5.595E+02				
		5.517E+02	5.441E+02	5.367E+02	5.294E+02	5.223E+02	5.153E+02	5.084E+02	5.017E+02	4.952E+02	4.887E+02	4.825E+02	4.763E+02	4.703E+02	4.644E+02	4.585E+02	4.528E+02	4.474E+02	4.419E+02	4.366E+02	4.314E+02				
		4.263E+02	4.213E+02	4.164E+02	4.116E+02	4.069E+02	4.023E+02	3.977E+02	3.933E+02	3.890E+02	3.847E+02	3.806E+02	3.765E+02	3.725E+02	3.686E+02	3.647E+02	3.610E+02	3.573E+02	3.537E+02	3.501E+02	3.479E+02				
		3.440E+02	3.406E+02	3.371E+02	3.339E+02	3.308E+02	3.277E+02	3.247E+02	3.217E+02	3.188E+02	3.159E+02	3.131E+02	3.104E+02	3.077E+02	3.050E+02	3.024E+02	2.999E+02	2.974E+02	2.949E+02	2.925E+02	2.902E+02				
		2.879E+02	2.856E+02	2.834E+02	2.812E+02	2.790E+02	2.769E+02	2.748E+02	2.728E+02	2.708E+02	2.688E+02	2.510E+02	2.359E+02	1.884E+02	1.618E+02	1.452E+02	1.216E+02	1.056E+02	8.261E+01	6.119E+01	4.174E+01				
		3.271E+01	2.808E+01	2.550E+01	2.281E+01	2.129E+01	1.852E+01	1.559E+01	9.364E+00	3.490E+00	1.333E+00														
PWR 50000.	3.56	1.299E+04	7.424E+03	5.032E+03	3.803E+03	3.130E+03	2.714E+03	2.450E+03	2.266E+03	2.131E+03	2.032E+03	1.944E+03	1.873E+03	1.812E+03	1.759E+03	1.714E+03	1.664E+03	1.624E+03	1.586E+03	1.551E+03	1.522E+03				
		1.486E+03	1.455E+03	1.425E+03	1.397E+03	1.369E+03	1.343E+03	1.317E+03	1.292E+03	1.268E+03	1.248E+03	1.223E+03	1.200E+03	1.179E+03	1.158E+03	1.137E+03	1.118E+03	1.098E+03	1.080E+03	1.061E+03	1.044E+03				
		1.026E+03	1.009E+03	9.927E+02	9.766E+02	9.609E+02	9.455E+02	9.305E+02	9.160E+02	9.017E+02	8.904E+02	8.744E+02	8.610E+02	8.480E+02	8.354E+02	8.230E+02	8.110E+02	7.993E+02	7.878E+02	7.766E+02	7.656E+02				
		7.549E+02	7.444E+02	7.342E+02	7.241E+02	7.143E+02	7.047E+02	6.954E+02	6.862E+02	6.772E+02	6.684E+02	6.598E+02	6.514E+02	6.432E+02	6.352E+02	6.273E+02	6.196E+02	6.120E+02	6.047E+02	5.974E+02	5.904E+02				
		5.834E+02	5.767E+02	5.700E+02	5.635E+02	5.571E+02	5.509E+02	5.448E+02	5.388E+02	5.329E+02	5.272E+02	5.216E+02	5.161E+02	5.107E+02	5.054E+02	5.002E+02	4.951E+02	4.901E+02	4.852E+02	4.805E+02	4.778E+02				
		4.722E+02	4.675E+02	4.630E+02	4.586E+02	4.544E+02	4.502E+02	4.461E+02	4.421E+02	4.382E+02	4.343E+02	4.305E+02	4.268E+02	4.231E+02	4.196E+02	4.161E+02	4.126E+02	4.092E+02	4.059E+02	4.026E+02	3.994E+02				
		3.963E+02	3.932E+02	3.902E+02	3.872E+02	3.843E+02	3.814E+02	3.786E+02	3.758E+02	3.730E+02	3.704E+02	3.459E+02	3.252E+02	2.581E+02	2.189E+02	1.944E+02	1.599E+02	1.378E+02	1.071E+02	7.961E+01	5.474E+01				
		4.324E+01	3.715E+01	3.380E+01	3.013E+01	2.805E+01	2.413E+01	2.005E+01	1.156E+01	4.116E+00	1.622E+00														
PWR 50000.	4.26	1.235E+04	7.018E+03	4.746E+03	3.585E+03	2.952E+03	2.563E+03	2.314E+03	2.145E+03	2.019E+03	1.926E+03	1.844E+03	1.778E+03	1.721E+03	1.672E+03	1.632E+03	1.584E+03	1.547E+03	1.512E+03	1.479E+03	1.453E+03				
		1.420E+03	1.391E+03	1.363E+03	1.336E+03	1.311E+03	1.286E+03	1.262E+03	1.238E+03	1.216E+03	1.196E+03	1.173E+03	1.152E+03	1.132E+03	1.112E+03	1.093E+03	1.074E+03	1.056E+03	1.038E+03	1.020E+03	1.004E+03				
		9.870E+02	9.709E+02	9.552E+02	9.398E+02	9.248E+02	9.102E+02	8.959E+02	8.819E+02	8.682E+02	8.571E+02	8.419E+02	8.290E+02	8.165E+02	8.044E+02	7.925E+02	7.810E+02	7.697E+02	7.586E+02	7.478E+02	7.372E+02				
		7.269E+02	7.167E+02	7.068E+02	6.971E+02	6.876E+02	6.783E+02	6.693E+02	6.604E+02	6.517E+02	6.431E+02	6.348E+02	6.266E+02	6.187E+02	6.108E+02	6.032E+02	5.957E+02	5.883E+02	5.811E+02	5.741E+02	5.672E+02				
		5.604E+02	5.538E+02	5.473E+02	5.410E+02	5.348E+02	5.287E+02	5.227E+02	5.169E+02	5.111E+02	5.055E+02	5.000E+02	4.946E+02	4.894E+02	4.842E+02	4.791E+02	4.741E+02	4.692E+02	4.645E+02	4.598E+02	4.569E+02				
		4.516E+02	4.470E+02	4.425E+02	4.383E+02	4.341E+02	4.300E+02	4.260E+02	4.221E+02	4.182E+02	4.144E+02	4.107E+02	4.071E+02	4.035E+02	4.000E+02	3.965E+02	3.932E+02	3.898E+02	3.866E+02	3.834E+02	3.802E+02				
		3.771E+02	3.741E+02	3.711E+02	3.682E+02	3.653E+02	3.625E+02	3.598E+02	3.570E+02	3.544E+02	3.517E+02	3.278E+02	3.075E+02	2.423E+02	2.050E+02	1.817E+02	1.494E+02	1.288E+02	1.003E+02	7.469E+01	5.159E+01				
		4.085E+01	3.516E+01	3.205E+01	2.862E+01	2.666E+01	2.298E+01	1.915E+01	1.112E+01	4.015E+00	1.597E+00														
PWR 50000.	4.96	1.175E+04	6.645E+03	4.491E+03	3.391E+03	2.800E+03	2.437E+03	2.206E+03	2.047E+03	1.930E+03	1.843E+03	1.765E+03	1.704E+03	1.651E+03	1.604E+03	1.565E+03	1.521E+03	1.486E+03	1.453E+03	1.421E+03	1.396E+03				
		1.364E+03	1.336E+03	1.310E+03	1.285E+03	1.260E+03	1.236E+03	1.213E+03	1.191E+03	1.169E+03	1.151E+03	1.129E+03	1.109E+03	1.089E+03	1.070E+03	1.052E+03	1.034E+03	1.016E+03	9.989E+02	9.822E+02	9.658E+02				
		9.498E+02	9.342E+02	9.190E+02	9.041E+02	8.895E+02	8.753E+02	8.614E+02	8.479E+02	8.346E+02	8.237E+02	8.090E+02	7.964E+02	7.843E+02	7.725E+02	7.609E+02	7.497E+02	7.386E+02	7.279E+02	7.173E+02	7.070E+02				
		6.969E+02	6.870E+02	6.773E+02	6.678E+02	6.586E+02	6.495E+02	6.406E+02	6.319E+02	6.234E+02	6.151E+02	6.069E+02	5.989E+02	5.911E+02	5.834E+02	5.759E+02	5.686E+02	5.614E+02	5.544E+02	5.475E+02	5.407E+02				
		5.341E+02	5.276E+02	5.212E+02	5.150E+02	5.089E+02	5.030E+02	4.971E+02	4.914E+02	4.858E+02	4.803E+02	4.749E+02	4.696E+02	4.644E+02	4.593E+02	4.543E+02	4.495E+02	4.447E+02	4.400E+02	4.354E+02	4.325E+02				
		4.273E+02	4.227E+02	4.184E+02	4.142E+02	4.101E+02	4.061E+02	4.022E+02	3.983E+02	3.946E+02	3.909E+02	3.872E+02	3.837E+02	3.802E+02	3.767E+02	3.733E+02	3.700E+02	3.668E+02	3.636E+02	3.605E+02	3.574E+02				
		3.544E+02	3.514E+02	3.485E+02	3.457E+02	3.429E+02	3.401E+02	3.374E+02	3.347E+02	3.321E+02	3.296E+02	3.063E+02	2.866E+02	2.239E+02	1.888E+02	1.674E+02	1.378E+02	1.190E+02	9.280E+01	6.941E+01	4.826E+01				
		3.841E+01	3.319E+01	3.032E+01	2.714E+01	2.529E+01	2.186E+01	1.825E+01	1.069E+01	3.909E+00	1.566E+00														
PWR 60000.	4.03	1.479E+04	8.775E+03	6.119E+03	4.716E+03	3.933E+03	3.434E+03	3.109E+03	2.880E+03	2.708E+03	2.582E+03	2.468E+03	2.376E+03	2.297E+03	2.227E+03	2.167E+03	2.103E+03	2.050E+03	2.001E+03	1.954E+03	1.915E+03				
		1.868E+03	1.827E+03	1.788E+03	1.751E+03	1.715E+03	1.680E+03	1.646E+03	1.614E+03	1.582E+03	1.555E+03	1.523E+03	1.493E+03	1.465E+03	1.438E+03	1.411E+03	1.386E+03	1.361E+03	1.336E+03	1.312E+03	1.289E+03				
		1.267E+03	1.245E+03	1.223E+03	1.202E+03	1.182E+03	1.162E+03	1.143E+03	1.124E+03	1.106E+03	1.091E+03	1.071E+03	1.053E+03	1.037E+03	1.020E+03	1.005E+03	9.892E+02	9.742E+02	9.595E+02	9.451E+02	9.311E+02				
		9.174E+02	9.040E+02	8.907E+02	8.781E+02	8.656E+02	8.534E+02	8.415E+02	8.298E+02	8.184E+02	8.073E+02	7.964E+02	7.857E+02	7.753E+02	7.651E+02	7.551E+02	7.453E+02	7.358E+02	7.264E+02	7.173E+02	7.084E+02				
		6.998E+02	6.910E+02	6.827E+02	6.745E+02	6.664E+02	6.585E+02	6.509E+02	6.433E+02	6.359E+02	6.287E+02	6.216E+02	6.147E+02	6.079E+02	6.013E+02	5.947E+02	5.884E+02	5.821E+02	5.760E+02	5.700E+02	5.664E+02				
		5.594E+02	5.535E+02	5.479E+02	5.424E+02	5.371E+02	5.318E+02	5.267E+02	5.217E+02	5.168E+02	5.119E+02	5.072E+02	5.025E+02	4.980E+02	4.935E+02	4.891E+02	4.848E+02	4.805E+02	4.764E+02	4.723E+02	4.683E+02				
		4.643E+02	4.605E+02	4.567E+02	4.530E+02	4.493E+02	4.457E+02	4.422E+02	4.387E+02	4.353E+02	4.319E+02	4.014E+02	3.755E+02	2.915E+02	2.430E+02	2.129E+02	1.724E+02	1.477E+02	1.151E+02	8.705E+01	6.179E+01				
		4.996E+01	4.352E+01	3.988E+01	3.566E+01	3.318E+01	2.838E+01	2.342E+01	1.316E+01	4.590E+00	1.886E+00														
PWR 60000.	4.73	1.411E+04	8.326E+03	5.788E+03	4.453E+03	3.711E+03	3.241E+03	2.935E+03	2.720E+03	2.560E+03	2.441E+03	2.333E+03	2.248E+03	2.175E+03	2.110E+03	2.057E+03	1.996E+03	1.947E+03	1.901E+03	1.858E+03	1.824E+03				
		1.781E+03	1.743E+03	1.707E+03	1.672E+03	1.639E+03	1.607E+03	1.575E+03	1.545E+03	1.516E+03	1.490E+03	1.460E+03	1.433E+03	1.406E+03	1.381E+03	1.356E+03	1.332E+03	1.308E+03	1.285E+03	1.263E+03	1.241E+03				
		1.220E+03	1.199E+03	1.179E+03	1.159E+03	1.140E+03	1.121E+03	1.103E+03	1.085E+03	1.068E+03	1.053E+03	1.034E+03	1.018E+03	1.002E+03	9.863E+02	9.712E+02	9.565E+02	9.421E+02	9.281E+02	9.143E+02	9.009E+02				
		8.878E+02	8.749E+02	8.624E+02	8.501E+02	8.381E+02	8.263E+02	8.149E+02	8.036E+02	7.926E+02	7.819E+02	7.713E+02	7.610E+02	7.510E+02	7.411E+02	7.314E+02	7.220E+02	7.128E+02	7.037E+02	6.948E+02	6.862E+02				
		6.777E+02	6.693E+02	6.612E+02	6.532E+02	6.454E+02	6.378E+02	6.303E+02	6.229E+02	6.157E+02	6.087E+02	6.018E+02	5.950E+02	5.884E+02	5.819E+02	5.755E+02	5.693E+02	5.632E+02	5.572E+02	5.513E+02	5.476E+02				
		5.409E+02	5.351E+02	5.296E+02	5.243E+02	5.190E+02	5.139E+02	5.089E+02	5.040E+02	4.991E+02	4.944E+02	4.897E+02	4.851E+02	4.807E+02	4.763E+02	4.719E+02	4.677E+02	4.635E+02	4.594E+02	4.554E+02	4.515E+02				
		4.476E+02	4.438E+02	4.401E+02	4.364E+02	4.328E+02	4.293E+02	4.258E+02	4.224E+02	4.190E+02	4.157E+02	3.857E+02	3.602E+02	2.777E+02	2.306E+02	2.018E+02	1.631E+02	1.396E+02	1.088E+02	8.232E+01	5.850E+01				
		4.739E+01	4.134E+01	3.791E+01	3.395E+01	3.159E+01	2.709E+01	2.239E+01	1.269E+01	4.490E+00	1.866E+00														
PWR 60000.	5.43	1.346E+04	7.901E+03	5.482E+03	4.218E+03	3.516E+03	3.075E+03	2.788E+03	2.587E+03	2.436E+03	2.324E+03	2.224E+03	2.144E+03	2.078E+03	2.015E+03	1.965E+03	1.908E+03	1.862E+03	1.820E+03	1.779E+03	1.747E+03				
		1.705E+03	1.669E+03	1.635E+03	1.603E+03	1.571E+03	1.541E+03	1.511E+03	1.482E+03	1.454E+03	1.432E+03	1.403E+03	1.377E+03	1.352E+03	1.328E+03	1.304E+03	1.281E+03	1.259E+03	1.237E+03	1.215E+03	1.195E+03				
		1.174E+03	1.155E+03	1.136E+03	1.116E+03	1.098E+03	1.080E+03	1.062E+03	1.045E+03	1.028E+03	1.015E+03	9.960E+02	9.801E+02	9.648E+02	9.500E+02	9.354E+02	9.212E+02	9.073E+02	8.937E+02	8.805E+02	8.675E+02				
		8.548E+02	8.423E+02	8.302E+02	8.183E+02	8.066E+02	7.952E+02	7.841E+02	7.732E+02	7.625E+02	7.520E+02	7.418E+02	7.318E+02	7.220E+02	7.124E+02	7.030E+02	6.938E+02	6.848E+02	6.760E+02	6.674E+02	6.589E+02				
		6.506E+02	6.425E+02	6.346E+02	6.268E+02	6.192E+02	6.117E+02	6.044E+02	5.972E+02	5.902E+02	5.833E+02	5.765E+02	5.699E+02	5.634E+02	5.571E+02	5.509E+02	5.448E+02	5.388E+02	5.329E+02	5.272E+02	5.233E+02				
		5.170E+02	5.113E+02	5.059E+02	5.007E+02	4.956E+02	4.906E+02	4.857E+02	4.808E+02	4.761E+02	4.715E+02	4.669E+02	4.624E+02	4.580E+02	4.537E+02	4.495E+02	4.454E+02	4.413E+02	4.373E+02	4.333E+02	4.295E+02				

4.257E+02 4.220E+02 4.183E+02 4.148E+02 4.112E+02 4.078E+02 4.044E+02 4.010E+02 3.977E+02 3.945E+02 3.652E+02 3.403E+02 2.605E+02 2.157E+02 1.884E+02 1.524E+02 1.305E+02 1.019E+02 7.720E+01 5.509E+01
4.473E+01 3.908E+01 3.589E+01 3.220E+01 2.999E+01 2.575E+01 2.135E+01 1.220E+01 4.378E+00 1.831E+00

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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.000      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr850a.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      2.1774 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   1.69                               **
/COM, **    Burnup (MWd/MTU):       10000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   849.98,   844.51,   839.10,   833.75,   828.45,   823.21,
ASSY( 7,1)=   818.03,   812.91,   807.83,   802.82,   797.85,   773.80,
ASSY(13,1)=   750.96,   729.24,   708.58,   688.90,   670.14,   652.23,
ASSY(19,1)=   635.13,   618.78,   603.14,   588.15,   573.80,   560.03,
ASSY(25,1)=   546.82,   533.63,   520.55,   508.00,   495.94,   397.48,
ASSY(31,1)=   330.14,   283.63,   249.64,   225.73,   207.51,   194.73,
ASSY(37,1)=   184.47,   176.90,   170.56,   165.61,   161.36,   157.94,
ASSY(43,1)=   154.79,   151.91,   149.32,   147.08,   144.98,   129.47,
ASSY(49,1)=   118.38,   109.34,   101.49,    94.51,    88.23,    82.59,
ASSY(55,1)=    77.54,    72.97,    68.81,    65.07,    61.69,    58.60,
ASSY(61,1)=    55.82,    53.32,    51.05,    48.98,    47.17,    35.76,
ASSY(67,1)=    30.76,    27.87,    25.87,    24.11,    22.68,    21.34,
ASSY(73,1)=    20.20,    19.00,    17.96,    17.06,    16.26,    15.42,
ASSY(79,1)=    14.67,    14.00,    13.40,    12.85,    12.35,     8.73,
ASSY(85,1)=     7.05,     6.17,     5.70,     5.41,     5.18,     5.02,
ASSY(91,1)=     4.89,     4.73,     4.59,     4.46,     4.35,     4.22,
ASSY(97,1)=     4.11,     4.01,     3.91,     3.83,     3.74,     2.89,
ASSY(103,1)=     2.41,     1.91,     1.58,     1.35,     1.17,     1.04,
ASSY(109,1)=    0.930,    0.794,    0.688,    0.602,    0.533,    0.475,
ASSY(115,1)=    0.427,    0.386,    0.351,    0.321,    0.295,    0.151,
ASSY(121,1)=    0.093,    0.065,    0.048,    0.037,    0.030,    0.024,
ASSY(127,1)=    0.020,    0.017,    0.015,    0.013,    0.012,    0.010,
ASSY(133,1)=    0.009,    0.008,    0.008,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr850b.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      3.2594 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   2.44                               **
/COM, **    Burnup (MWd/MTU):       20000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   849.99,   846.54,   843.12,   839.72,   836.34,   832.99,
ASSY( 7,1)=   829.66,   826.35,   823.07,   819.81,   816.58,   800.72,
ASSY(13,1)=   785.40,   770.58,   756.25,   742.38,   728.95,   715.94,
ASSY(19,1)=   703.33,   691.10,   679.25,   667.74,   656.57,   645.98,
ASSY(25,1)=   636.74,   627.74,   618.97,   610.43,   602.11,   529.22,
ASSY(31,1)=   475.93,   436.01,   406.04,   383.30,   365.33,   351.03,
ASSY(37,1)=   339.21,   329.41,   321.21,   314.34,   307.90,   301.86,
ASSY(43,1)=   296.53,   291.81,   287.44,   283.38,   279.59,   250.19,
ASSY(49,1)=   228.23,   209.95,   194.05,   179.89,   167.24,   155.85,
ASSY(55,1)=   145.80,   136.62,   128.31,   120.83,   114.08,   107.99,
ASSY(61,1)=   102.46,    97.48,    93.00,    88.93,    85.33,    62.73,
ASSY(67,1)=    52.82,    47.09,    43.26,    40.00,    37.35,    34.93,
ASSY(73,1)=    32.87,    30.75,    28.93,    27.35,    25.95,    24.48,
ASSY(79,1)=    23.18,    22.02,    20.98,    20.05,    19.19,    12.99,
ASSY(85,1)=    10.10,     8.63,     7.85,     7.40,     7.03,     6.79,
ASSY(91,1)=     6.58,     6.34,     6.13,     5.94,     5.78,     5.60,
ASSY(97,1)=     5.43,     5.29,     5.15,     5.02,     4.91,     3.70,
ASSY(103,1)=     3.03,     2.39,     1.97,     1.67,     1.44,     1.27,
ASSY(109,1)=     1.14,    0.981,    0.857,    0.757,    0.675,    0.607,
ASSY(115,1)=    0.549,    0.500,    0.457,    0.420,    0.388,    0.207,
ASSY(121,1)=    0.133,    0.094,    0.071,    0.056,    0.045,    0.038,
ASSY(127,1)=    0.032,    0.028,    0.024,    0.021,    0.019,    0.017,
ASSY(133,1)=    0.015,    0.014,    0.013,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr850c.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      4.4250 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.11                               **
/COM, **    Burnup (MWd/MTU):       30000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   850.00,   848.02,   846.06,   844.10,   842.15,   840.21,
ASSY( 7,1)=   838.27,   836.35,   834.44,   832.53,   830.63,   821.27,
ASSY(13,1)=   812.11,   803.15,   794.39,   785.81,   777.41,   769.19,
ASSY(19,1)=   761.13,   753.24,   746.10,   739.67,   733.35,   727.15,
ASSY(25,1)=   721.07,   715.09,   709.21,   703.44,   697.77,   645.99,
ASSY(31,1)=   608.79,   577.41,   553.58,   532.82,   516.20,   501.38,
ASSY(37,1)=   489.39,   478.55,   468.36,   458.83,   450.70,   443.19,
ASSY(43,1)=   436.32,   429.86,   423.85,   418.15,   413.17,   369.41,
ASSY(49,1)=   335.33,   307.20,   282.16,   260.20,   240.68,   223.51,
ASSY(55,1)=   207.90,   193.89,   181.29,   169.96,   159.76,   150.56,
ASSY(61,1)=   142.28,   134.78,   128.04,   122.13,   116.61,    82.82,
ASSY(67,1)=    68.04,    59.67,    54.25,    49.78,    46.19,    43.10,
ASSY(73,1)=    40.46,    37.80,    35.52,    33.55,    31.79,    30.00,
ASSY(79,1)=    28.42,    27.00,    25.74,    24.59,    23.54,    15.99,
ASSY(85,1)=    12.47,    10.66,     9.68,     9.11,     8.65,     8.34,
ASSY(91,1)=     8.07,     7.76,     7.48,     7.24,     7.02,     6.79,
ASSY(97,1)=     6.58,     6.39,     6.21,     6.05,     5.90,     4.38,
ASSY(103,1)=     3.54,     2.77,     2.27,     1.92,     1.66,     1.46,
ASSY(109,1)=     1.30,     1.13,    0.997,    0.887,    0.796,    0.719,
ASSY(115,1)=    0.655,    0.599,    0.551,    0.509,    0.472,    0.261,
ASSY(121,1)=    0.171,    0.124,    0.095,    0.076,    0.062,    0.052,
ASSY(127,1)=    0.045,    0.039,    0.034,    0.031,    0.027,    0.025,
ASSY(133,1)=    0.023,    0.021,    0.019,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr850d.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      6.5969 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.72                               **
/COM, **    Burnup (MWd/MTU):       40000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   850.00,   849.13,   848.26,   847.40,   846.54,   845.68,
ASSY( 7,1)=   844.82,   843.96,   843.11,   842.26,   841.41,   837.19,
ASSY(13,1)=   833.03,   828.92,   824.86,   820.85,   816.88,   813.51,
ASSY(19,1)=   810.21,   806.95,   803.73,   800.53,   797.38,   794.25,
ASSY(25,1)=   791.16,   788.11,   785.08,   782.09,   779.13,   751.69,
ASSY(31,1)=   729.08,   708.97,   692.84,   677.72,   663.04,   649.64,
ASSY(37,1)=   638.30,   627.66,   617.76,   608.47,   599.99,   592.05,
ASSY(43,1)=   584.99,   577.94,   569.95,   562.50,   556.16,   501.26,
ASSY(49,1)=   456.46,   418.87,   385.31,   355.69,   329.35,   305.83,
ASSY(55,1)=   284.82,   266.05,   249.20,   233.99,   220.30,   207.97,
ASSY(61,1)=   196.83,   186.75,   177.66,   169.75,   162.19,   115.65,
ASSY(67,1)=    94.26,    81.70,    73.51,    66.90,    61.62,    57.20,
ASSY(73,1)=    53.44,    49.84,    46.76,    44.09,    41.71,    39.33,
ASSY(79,1)=    37.23,    35.36,    33.68,    32.16,    30.76,    20.82,
ASSY(85,1)=    16.21,    13.82,    12.54,    11.79,    11.18,    10.77,
ASSY(91,1)=    10.42,    10.01,     9.65,     9.33,     9.04,     8.74,
ASSY(97,1)=     8.47,     8.22,     8.00,     7.79,     7.59,     5.61,
ASSY(103,1)=     4.52,     3.55,     2.91,     2.46,     2.12,     1.87,
ASSY(109,1)=     1.66,     1.46,     1.29,     1.15,     1.04,    0.943,
ASSY(115,1)=    0.861,    0.791,    0.730,    0.677,    0.630,    0.357,
ASSY(121,1)=    0.238,    0.174,    0.135,    0.109,    0.090,    0.077,
ASSY(127,1)=    0.066,    0.058,    0.051,    0.046,    0.041,    0.037,
ASSY(133,1)=    0.034,    0.031,    0.029,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr850e.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      11.1743 (RHBIII)                   **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   4.26                               **
/COM, **    Burnup (MWd/MTU):       50000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   850.00,   849.68,   849.36,   849.05,   848.73,   848.41,
ASSY( 7,1)=   848.10,   847.78,   847.46,   847.15,   846.83,   845.27,
ASSY(13,1)=   843.71,   842.16,   840.62,   839.09,   837.57,   836.06,
ASSY(19,1)=   834.56,   833.06,   831.58,   830.11,   828.64,   827.18,
ASSY(25,1)=   825.73,   824.31,   822.92,   821.54,   820.16,   806.83,
ASSY(31,1)=   794.41,   782.96,   772.45,   763.10,   753.21,   742.00,
ASSY(37,1)=   731.88,   723.24,   714.88,   706.72,   698.81,   691.12,
ASSY(43,1)=   684.09,   678.03,   671.44,   663.75,   656.47,   594.72,
ASSY(49,1)=   542.54,   496.85,   456.64,   421.16,   389.58,   361.46,
ASSY(55,1)=   336.45,   313.99,   293.88,   275.80,   259.49,   244.83,
ASSY(61,1)=   231.56,   219.58,   209.17,   199.19,   190.27,   134.44,
ASSY(67,1)=   107.94,    92.41,    82.24,    74.31,    68.06,    63.06,
ASSY(73,1)=    58.79,    54.85,    51.48,    48.56,    45.93,    43.43,
ASSY(79,1)=    41.20,    39.21,    37.43,    35.81,    34.31,    23.79,
ASSY(85,1)=    18.88,    16.28,    14.85,    13.98,    13.27,    12.78,
ASSY(91,1)=    12.36,    11.85,    11.40,    11.01,    10.65,    10.29,
ASSY(97,1)=     9.95,     9.65,     9.37,     9.12,     8.88,     6.46,
ASSY(103,1)=    5.16,     4.02,     3.29,     2.77,     2.39,     2.09,
ASSY(109,1)=    1.86,     1.64,     1.46,     1.31,     1.19,     1.09,
ASSY(115,1)=   0.997,    0.920,    0.852,    0.793,    0.741,    0.432,
ASSY(121,1)=   0.295,    0.219,    0.172,    0.140,    0.117,    0.100,
ASSY(127,1)=   0.087,    0.077,    0.068,    0.061,    0.056,    0.051,
ASSY(133,1)=   0.047,    0.043,    0.040,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr850f.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      19.7615 (RHBIII)                   **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   4.73                               **
/COM, **    Burnup (MWd/MTU):       60000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   850.00,   849.84,   849.69,   849.54,   849.38,   849.23,
ASSY( 7,1)=   849.07,   848.92,   848.76,   848.61,   848.46,   847.69,
ASSY(13,1)=   846.92,   846.10,   845.07,   844.04,   843.01,   841.99,
ASSY(19,1)=   840.98,   839.96,   838.96,   837.95,   836.95,   835.95,
ASSY(25,1)=   834.96,   833.96,   832.98,   831.99,   831.01,   821.66,
ASSY(31,1)=   812.85,   804.28,   795.93,   787.70,   779.59,   771.71,
ASSY(37,1)=   764.06,   756.53,   749.11,   741.68,   734.26,   727.08,
ASSY(43,1)=   720.13,   713.29,   706.57,   700.21,   694.18,   631.90,
ASSY(49,1)=   578.22,   531.03,   490.23,   452.29,   419.48,   390.19,
ASSY(55,1)=   363.97,   340.43,   319.34,   300.32,   283.20,   267.73,
ASSY(61,1)=   254.49,   241.40,   229.92,   219.45,   209.92,   149.44,
ASSY(67,1)=   119.13,   101.20,    89.32,    80.21,    73.18,    67.65,
ASSY(73,1)=    62.94,    58.80,    55.25,    52.16,    49.40,    46.87,
ASSY(79,1)=    44.62,    42.60,    40.78,    39.12,    37.57,    26.89,
ASSY(85,1)=    21.86,    19.11,    17.55,    16.54,    15.73,    15.14,
ASSY(91,1)=    14.63,    14.01,    13.47,    12.98,    12.55,    12.10,
ASSY(97,1)=    11.69,    11.32,    10.98,    10.67,    10.37,     7.44,
ASSY(103,1)=    5.88,     4.57,     3.72,     3.12,     2.68,     2.35,
ASSY(109,1)=    2.08,     1.85,     1.65,     1.49,     1.36,     1.25,
ASSY(115,1)=    1.15,     1.06,    0.989,    0.924,    0.866,    0.518,
ASSY(121,1)=   0.360,    0.271,    0.215,    0.177,    0.150,    0.129,
ASSY(127,1)=   0.113,    0.100,    0.089,    0.081,    0.074,    0.067,
ASSY(133,1)=   0.062,    0.058,    0.054,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.000      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA000.EXE                        **
/COM, **    Output File Name:       pwr1500a.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      1.3574 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   1.69                               **
/COM, **    Burnup (MWd/MTU):       10000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1500.00,  1487.32,  1474.84,  1462.56,  1450.46,  1438.55,
ASSY( 7,1)=  1426.82,  1415.26,  1403.88,  1392.67,  1381.63,  1328.77,
ASSY(13,1)=  1279.56,  1233.65,  1190.71,  1150.48,  1112.71,  1077.19,
ASSY(19,1)=  1043.73,  1012.15,   982.32,   953.18,   920.69,   890.05,
ASSY(25,1)=   861.11,   833.75,   807.83,   783.27,   759.95,   579.47,
ASSY(31,1)=   456.23,   369.73,   311.95,   269.61,   240.50,   218.17,
ASSY(37,1)=   202.70,   190.54,   181.65,   174.36,   168.72,   163.93,
ASSY(43,1)=   160.09,   156.76,   153.73,   150.92,   148.50,   131.57,
ASSY(49,1)=   120.01,   110.74,   102.70,    95.61,    89.21,    83.49,
ASSY(55,1)=    78.34,    73.69,    69.48,    65.67,    62.22,    59.08,
ASSY(61,1)=    56.27,    53.70,    51.40,    49.31,    47.47,    35.86,
ASSY(67,1)=    30.82,    27.90,    25.90,    24.14,    22.71,    21.36,
ASSY(73,1)=    20.22,    19.02,    17.98,    17.08,    16.28,    15.43,
ASSY(79,1)=    14.68,    14.01,    13.40,    12.86,    12.36,     8.74,
ASSY(85,1)=     7.05,     6.17,     5.70,     5.42,     5.18,     5.02,
ASSY(91,1)=     4.89,     4.73,     4.59,     4.46,     4.35,     4.22,
ASSY(97,1)=     4.11,     4.01,     3.91,     3.83,     3.74,     2.89,
ASSY(103,1)=     2.41,     1.91,     1.58,     1.35,     1.17,     1.04,
ASSY(109,1)=    0.930,    0.794,    0.688,    0.602,    0.533,    0.475,
ASSY(115,1)=    0.427,    0.386,    0.351,    0.321,    0.295,    0.151,
ASSY(121,1)=    0.093,    0.065,    0.048,    0.037,    0.030,    0.024,
ASSY(127,1)=    0.020,    0.017,    0.015,    0.013,    0.012,    0.010,
ASSY(133,1)=    0.009,    0.008,    0.008,
ASSY( 1,0)=  0.000001,      0.01,      0.02,      0.03,      0.04,      0.05,
ASSY( 7,0)=      0.06,      0.07,      0.08,      0.09,      0.10,      0.15,
ASSY(13,0)=      0.20,      0.25,      0.30,      0.35,      0.40,      0.45,
ASSY(19,0)=      0.50,      0.55,      0.60,      0.65,      0.70,      0.75,
ASSY(25,0)=      0.80,      0.85,      0.90,      0.95,      1.00,      1.50,
ASSY(31,0)=      2.00,      2.50,      3.00,      3.50,      4.00,      4.50,
ASSY(37,0)=      5.00,      5.50,      6.00,      6.50,      7.00,      7.50,
ASSY(43,0)=      8.00,      8.50,      9.00,      9.50,     10.00,     15.00,
ASSY(49,0)=     20.00,     25.00,     30.00,     35.00,     40.00,     45.00,
ASSY(55,0)=     50.00,     55.00,     60.00,     65.00,     70.00,     75.00,
ASSY(61,0)=     80.00,     85.00,     90.00,     95.00,    100.00,    150.00,
ASSY(67,0)=    200.00,    250.00,    300.00,    350.00,    400.00,    450.00,
ASSY(73,0)=    500.00,    550.00,    600.00,    650.00,    700.00,    750.00,
ASSY(79,0)=    800.00,    850.00,    900.00,    950.00,   1000.00,   1500.00,
ASSY(85,0)=   2000.00,   2500.00,   3000.00,   3500.00,   4000.00,   4500.00,
ASSY(91,0)=   5000.00,   5500.00,   6000.00,   6500.00,   7000.00,   7500.00,
ASSY(97,0)=   8000.00,   8500.00,   9000.00,   9500.00,  10000.00,  15000.00,
ASSY(103,0)=  20000.00,  25000.00,  30000.00,  35000.00,  40000.00,  45000.00,
ASSY(109,0)=  50000.00,  55000.00,  60000.00,  65000.00,  70000.00,  75000.00,
ASSY(115,0)=  80000.00,  85000.00,  90000.00,  95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr1500b.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      2.0912 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   2.44                               **
/COM, **    Burnup (MWd/MTU):       20000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1500.02,  1490.96,  1482.01,  1473.15,  1464.38,  1455.71,
ASSY( 7,1)=  1447.13,  1438.63,  1430.23,  1421.91,  1413.68,  1373.78,
ASSY(13,1)=  1335.85,  1299.75,  1265.36,  1232.56,  1201.26,  1171.34,
ASSY(19,1)=  1142.73,  1115.35,  1089.12,  1063.97,  1039.85,  1016.68,
ASSY(25,1)=   994.42,   973.02,   952.42,   931.86,   911.91,   747.38,
ASSY(31,1)=   630.99,   551.83,   491.09,   448.66,   414.42,   390.61,
ASSY(37,1)=   370.49,   355.67,   342.72,   332.61,   323.64,   316.59,
ASSY(43,1)=   310.03,   303.85,   298.18,   293.36,   288.85,   256.11,
ASSY(49,1)=   232.96,   214.00,   197.61,   183.07,   170.06,   158.44,
ASSY(55,1)=   148.11,   138.67,   130.19,   122.50,   115.60,   109.35,
ASSY(61,1)=   103.70,    98.60,    94.02,    89.85,    86.19,    63.03,
ASSY(67,1)=    52.98,    47.19,    43.35,    40.06,    37.41,    34.98,
ASSY(73,1)=    32.93,    30.80,    28.97,    27.39,    25.99,    24.51,
ASSY(79,1)=    23.21,    22.05,    21.01,    20.07,    19.21,    12.99,
ASSY(85,1)=    10.11,     8.63,     7.85,     7.40,     7.03,     6.79,
ASSY(91,1)=     6.58,     6.34,     6.13,     5.94,     5.78,     5.60,
ASSY(97,1)=     5.43,     5.29,     5.15,     5.02,     4.91,     3.70,
ASSY(103,1)=     3.03,     2.39,     1.97,     1.67,     1.44,     1.27,
ASSY(109,1)=     1.14,    0.981,    0.857,    0.757,    0.675,    0.607,
ASSY(115,1)=    0.549,    0.500,    0.457,    0.420,    0.388,    0.207,
ASSY(121,1)=    0.133,    0.094,    0.071,    0.056,    0.045,    0.038,
ASSY(127,1)=    0.032,    0.028,    0.024,    0.021,    0.019,    0.017,
ASSY(133,1)=    0.015,    0.014,    0.013,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr1500c.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      2.6876 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.11                               **
/COM, **    Burnup (MWd/MTU):       30000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1500.03,  1493.66,  1487.34,  1481.06,  1474.84,  1468.67,
ASSY( 7,1)=  1462.54,  1456.47,  1450.44,  1444.45,  1438.52,  1409.50,
ASSY(13,1)=  1381.56,  1354.65,  1328.69,  1303.20,  1278.45,  1254.56,
ASSY(19,1)=  1231.49,  1209.19,  1187.62,  1166.76,  1146.56,  1127.00,
ASSY(25,1)=  1108.06,  1089.69,  1071.88,  1054.60,  1037.83,   899.75,
ASSY(31,1)=   800.93,   725.61,   669.51,   625.19,   591.81,   564.22,
ASSY(37,1)=   542.41,   523.72,   508.26,   494.82,   483.59,   473.12,
ASSY(43,1)=   463.28,   454.43,   446.70,   439.51,   432.88,   382.63,
ASSY(49,1)=   346.30,   316.31,   290.43,   267.53,   247.20,   229.07,
ASSY(55,1)=   213.13,   198.57,   185.53,   173.76,   163.17,   153.63,
ASSY(61,1)=   145.05,   137.29,   130.29,   123.98,   118.48,    83.48,
ASSY(67,1)=    68.39,    59.89,    54.43,    49.92,    46.31,    43.20,
ASSY(73,1)=    40.56,    37.88,    35.60,    33.61,    31.86,    30.06,
ASSY(79,1)=    28.47,    27.05,    25.78,    24.63,    23.58,    16.01,
ASSY(85,1)=    12.48,    10.66,     9.68,     9.12,     8.65,     8.34,
ASSY(91,1)=     8.07,     7.76,     7.48,     7.24,     7.02,     6.79,
ASSY(97,1)=     6.58,     6.39,     6.21,     6.05,     5.90,     4.38,
ASSY(103,1)=     3.54,     2.77,     2.27,     1.92,     1.66,     1.46,
ASSY(109,1)=     1.30,     1.13,    0.997,    0.887,    0.796,    0.719,
ASSY(115,1)=    0.655,    0.599,    0.551,    0.509,    0.472,    0.261,
ASSY(121,1)=    0.171,    0.124,    0.095,    0.076,    0.062,    0.052,
ASSY(127,1)=    0.045,    0.039,    0.034,    0.031,    0.027,    0.025,
ASSY(133,1)=    0.023,    0.021,    0.019,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr1500d.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      3.4801 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.72                               **
/COM, **    Burnup (MWd/MTU):       40000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1499.99,  1495.46,  1490.95,  1486.47,  1482.01,  1477.58,
ASSY( 7,1)=  1473.18,  1468.80,  1464.45,  1460.12,  1455.81,  1434.66,
ASSY(13,1)=  1414.10,  1394.10,  1374.65,  1355.72,  1337.29,  1319.34,
ASSY(19,1)=  1301.86,  1285.97,  1271.22,  1256.81,  1242.73,  1228.98,
ASSY(25,1)=  1215.54,  1202.40,  1189.55,  1176.98,  1164.69,  1054.89,
ASSY(31,1)=   975.48,   908.64,   860.31,   818.21,   786.10,   757.40,
ASSY(37,1)=   734.18,   713.04,   696.50,   681.27,   666.38,   652.46,
ASSY(43,1)=   640.89,   630.07,   620.02,   610.53,   601.93,   533.72,
ASSY(49,1)=   483.36,   441.44,   405.68,   373.72,   345.41,   320.16,
ASSY(55,1)=   297.58,   277.53,   259.48,   243.28,   228.66,   215.52,
ASSY(61,1)=   203.64,   192.92,   183.22,   174.45,   166.77,   117.40,
ASSY(67,1)=    95.22,    82.29,    73.98,    67.27,    61.92,    57.45,
ASSY(73,1)=    53.69,    50.04,    46.93,    44.24,    41.86,    39.47,
ASSY(79,1)=    37.35,    35.47,    33.78,    32.25,    30.85,    20.86,
ASSY(85,1)=    16.22,    13.83,    12.54,    11.79,    11.18,    10.78,
ASSY(91,1)=    10.43,    10.02,     9.65,     9.33,     9.05,     8.74,
ASSY(97,1)=     8.47,     8.22,     8.00,     7.79,     7.59,     5.61,
ASSY(103,1)=     4.52,     3.55,     2.91,     2.46,     2.12,     1.87,
ASSY(109,1)=     1.66,     1.46,     1.29,     1.15,     1.04,    0.943,
ASSY(115,1)=    0.861,    0.791,    0.730,    0.677,    0.630,    0.357,
ASSY(121,1)=    0.238,    0.174,    0.135,    0.109,    0.090,    0.077,
ASSY(127,1)=    0.066,    0.058,    0.051,    0.046,    0.041,    0.037,
ASSY(133,1)=    0.034,    0.031,    0.029,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr1500e.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      4.5045 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   4.26                               **
/COM, **    Burnup (MWd/MTU):       50000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1500.01,  1497.12,  1494.24,  1491.37,  1488.51,  1485.66,
ASSY( 7,1)=  1482.83,  1480.01,  1477.20,  1474.40,  1471.61,  1457.83,
ASSY(13,1)=  1444.34,  1431.10,  1418.13,  1405.40,  1392.92,  1380.67,
ASSY(19,1)=  1368.77,  1358.27,  1347.94,  1337.80,  1327.83,  1318.02,
ASSY(25,1)=  1308.39,  1298.91,  1289.58,  1280.41,  1271.39,  1188.65,
ASSY(31,1)=  1127.76,  1074.23,  1032.51,   994.99,   964.48,   936.61,
ASSY(37,1)=   914.22,   893.48,   873.81,   855.47,   839.69,   824.87,
ASSY(43,1)=   811.28,   798.44,   786.78,   775.72,   766.23,   680.07,
ASSY(49,1)=   613.97,   559.48,   511.47,   469.50,   432.52,   400.23,
ASSY(55,1)=   370.43,   344.48,   321.21,   300.36,   281.62,   264.76,
ASSY(61,1)=   249.56,   235.83,   223.47,   212.67,   202.38,   139.23,
ASSY(67,1)=   110.57,    94.00,    83.46,    75.26,    68.81,    63.68,
ASSY(73,1)=    59.37,    55.34,    51.90,    48.92,    46.29,    43.74,
ASSY(79,1)=    41.48,    39.47,    37.65,    36.02,    34.51,    23.88,
ASSY(85,1)=    18.93,    16.30,    14.86,    13.99,    13.27,    12.79,
ASSY(91,1)=    12.37,    11.86,    11.41,    11.01,    10.66,    10.29,
ASSY(97,1)=     9.96,     9.65,     9.37,     9.12,     8.88,     6.46,
ASSY(103,1)=     5.16,     4.03,     3.29,     2.77,     2.39,     2.09,
ASSY(109,1)=     1.86,     1.64,     1.46,     1.31,     1.19,     1.09,
ASSY(115,1)=    0.997,    0.920,    0.852,    0.793,    0.741,    0.432,
ASSY(121,1)=    0.295,    0.219,    0.172,    0.140,    0.117,    0.100,
ASSY(127,1)=    0.087,    0.077,    0.068,    0.061,    0.056,    0.051,
ASSY(133,1)=    0.047,    0.043,    0.040,
ASSY( 1,0)=  0.000001,      0.01,      0.02,      0.03,      0.04,      0.05,
ASSY( 7,0)=      0.06,      0.07,      0.08,      0.09,      0.10,      0.15,
ASSY(13,0)=      0.20,      0.25,      0.30,      0.35,      0.40,      0.45,
ASSY(19,0)=      0.50,      0.55,      0.60,      0.65,      0.70,      0.75,
ASSY(25,0)=      0.80,      0.85,      0.90,      0.95,      1.00,      1.50,
ASSY(31,0)=      2.00,      2.50,      3.00,      3.50,      4.00,      4.50,
ASSY(37,0)=      5.00,      5.50,      6.00,      6.50,      7.00,      7.50,
ASSY(43,0)=      8.00,      8.50,      9.00,      9.50,     10.00,     15.00,
ASSY(49,0)=     20.00,     25.00,     30.00,     35.00,     40.00,     45.00,
ASSY(55,0)=     50.00,     55.00,     60.00,     65.00,     70.00,     75.00,
ASSY(61,0)=     80.00,     85.00,     90.00,     95.00,    100.00,    150.00,
ASSY(67,0)=    200.00,    250.00,    300.00,    350.00,    400.00,    450.00,
ASSY(73,0)=    500.00,    550.00,    600.00,    650.00,    700.00,    750.00,
ASSY(79,0)=    800.00,    850.00,    900.00,    950.00,   1000.00,   1500.00,
ASSY(85,0)=   2000.00,   2500.00,   3000.00,   3500.00,   4000.00,   4500.00,
ASSY(91,0)=   5000.00,   5500.00,   6000.00,   6500.00,   7000.00,   7500.00,
ASSY(97,0)=   8000.00,   8500.00,   9000.00,   9500.00,  10000.00,  15000.00,
ASSY(103,0)=  20000.00,  25000.00,  30000.00,  35000.00,  40000.00,  45000.00,
ASSY(109,0)=  50000.00,  55000.00,  60000.00,  65000.00,  70000.00,  75000.00,
ASSY(115,0)=  80000.00,  85000.00,  90000.00,  95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       pwr1500f.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      6.0238 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   4.73                               **
/COM, **    Burnup (MWd/MTU):       60000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.464                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1500.00,  1498.40,  1496.80,  1495.21,  1493.63,  1492.04,
ASSY( 7,1)=  1490.46,  1488.89,  1487.32,  1485.75,  1484.19,  1476.45,
ASSY(13,1)=  1468.81,  1461.27,  1453.82,  1446.47,  1439.22,  1432.06,
ASSY(19,1)=  1424.99,  1418.01,  1411.11,  1404.30,  1397.57,  1390.93,
ASSY(25,1)=  1384.36,  1377.87,  1371.46,  1365.13,  1359.21,  1306.99,
ASSY(31,1)=  1260.15,  1221.55,  1186.42,  1157.87,  1131.35,  1105.50,
ASSY(37,1)=  1081.51,  1061.24,  1042.22,  1024.85,  1008.44,   993.01,
ASSY(43,1)=   978.43,   965.87,   953.74,   939.29,   925.58,   825.95,
ASSY(49,1)=   745.28,   677.13,   617.78,   565.84,   519.94,   479.60,
ASSY(55,1)=   443.65,   411.79,   383.28,   357.77,   334.91,   314.36,
ASSY(61,1)=   295.86,   279.16,   264.09,   250.91,   238.39,   161.29,
ASSY(67,1)=   125.71,   105.15,    92.27,    82.49,    74.89,    69.07,
ASSY(73,1)=    64.20,    59.87,    56.17,    52.97,    50.15,    47.53,
ASSY(79,1)=    45.21,    43.13,    41.26,    39.56,    38.00,    27.06,
ASSY(85,1)=    21.95,    19.16,    17.58,    16.57,    15.75,    15.16,
ASSY(91,1)=    14.65,    14.03,    13.48,    13.00,    12.56,    12.11,
ASSY(97,1)=    11.70,    11.33,    10.99,    10.67,    10.38,     7.45,
ASSY(103,1)=     5.89,     4.57,     3.72,     3.12,     2.68,     2.35,
ASSY(109,1)=     2.08,     1.85,     1.65,     1.49,     1.36,     1.25,
ASSY(115,1)=     1.15,     1.06,    0.989,    0.924,    0.866,    0.518,
ASSY(121,1)=    0.360,    0.271,    0.215,    0.177,    0.150,    0.129,
ASSY(127,1)=    0.113,    0.100,    0.089,    0.081,    0.074,    0.067,
ASSY(133,1)=    0.062,    0.058,    0.054,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       stx1500f.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      7.8107 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   4.73                               **
/COM, **    Burnup (MWd/MTU):       60000                              **
/COM, **    Assembly Type:          PWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.544                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=  1500.01,  1498.91,  1497.82,  1496.73,  1495.65,  1494.56,
ASSY( 7,1)=  1493.48,  1492.40,  1491.32,  1490.25,  1489.17,  1483.84,
ASSY(13,1)=  1478.66,  1473.93,  1469.25,  1464.61,  1460.01,  1455.46,
ASSY(19,1)=  1450.94,  1446.47,  1442.04,  1437.65,  1433.29,  1428.98,
ASSY(25,1)=  1424.70,  1420.46,  1416.26,  1412.09,  1407.96,  1371.45,
ASSY(31,1)=  1339.42,  1308.75,  1279.66,  1254.16,  1231.23,  1210.09,
ASSY(37,1)=  1190.38,  1171.81,  1154.26,  1138.59,  1124.26,  1108.36,
ASSY(43,1)=  1091.87,  1077.30,  1064.04,  1051.17,  1038.73,   932.22,
ASSY(49,1)=   843.50,   767.59,   701.37,   643.40,   592.07,   546.71,
ASSY(55,1)=   506.31,   470.42,   438.31,   409.56,   383.74,   360.52,
ASSY(61,1)=   339.61,   320.76,   303.73,   288.66,   274.68,   187.16,
ASSY(67,1)=   146.32,   122.65,   107.71,    96.36,    87.54,    80.76,
ASSY(73,1)=    75.08,    70.03,    65.71,    61.98,    58.68,    55.63,
ASSY(79,1)=    52.92,    50.49,    48.30,    46.32,    44.49,    31.70,
ASSY(85,1)=    25.72,    22.46,    20.60,    19.42,    18.46,    17.77,
ASSY(91,1)=    17.17,    16.44,    15.80,    15.24,    14.73,    14.20,
ASSY(97,1)=    13.72,    13.28,    12.88,    12.51,    12.17,     8.73,
ASSY(103,1)=    6.90,     5.36,     4.36,     3.66,     3.15,     2.75,
ASSY(109,1)=    2.44,     2.16,     1.94,     1.75,     1.59,     1.46,
ASSY(115,1)=    1.35,     1.25,     1.16,     1.08,     1.02,    0.607,
ASSY(121,1)=   0.422,    0.318,    0.252,    0.208,    0.175,    0.151,
ASSY(127,1)=   0.132,    0.117,    0.105,    0.095,    0.086,    0.079,
ASSY(133,1)=   0.073,    0.067,    0.063,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr400a.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      1.9978 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   1.30                               **
/COM, **    Burnup (MWd/MTU):       10000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   400.00,   397.40,   394.73,   392.08,   389.46,   386.88,
ASSY( 7,1)=   384.32,   381.79,   379.29,   376.82,   374.38,   362.57,
ASSY(13,1)=   351.39,   340.79,   330.74,   321.19,   312.11,   303.46,
ASSY(19,1)=   295.22,   287.36,   279.86,   272.69,   265.84,   259.28,
ASSY(25,1)=   252.99,   246.96,   241.18,   235.63,   230.30,   183.87,
ASSY(31,1)=   151.29,   129.76,   113.12,   102.16,    93.09,    87.26,
ASSY(37,1)=    82.20,    78.77,    75.70,    73.48,    71.45,    69.95,
ASSY(43,1)=    68.56,    67.30,    66.12,    65.17,    64.27,    58.03,
ASSY(49,1)=    53.67,    50.12,    47.03,    44.24,    41.70,    39.39,
ASSY(55,1)=    37.30,    35.41,    33.67,    32.10,    30.66,    29.35,
ASSY(61,1)=    28.16,    27.08,    26.08,    25.18,    24.42,    19.21,
ASSY(67,1)=    16.76,    15.21,    14.09,    13.08,    12.26,    11.49,
ASSY(73,1)=    10.83,    10.14,     9.55,     9.03,     8.57,     8.09,
ASSY(79,1)=     7.65,     7.27,     6.93,     6.61,     6.33,     4.27,
ASSY(85,1)=     3.32,     2.84,     2.58,     2.44,     2.32,     2.25,
ASSY(91,1)=     2.18,     2.11,     2.04,     1.98,     1.93,     1.87,
ASSY(97,1)=     1.82,     1.77,     1.73,     1.69,     1.65,     1.27,
ASSY(103,1)=     1.05,    0.827,    0.682,    0.580,    0.503,    0.444,
ASSY(109,1)=    0.398,    0.339,    0.294,    0.257,    0.228,    0.203,
ASSY(115,1)=    0.182,    0.165,    0.150,    0.137,    0.126,    0.064,
ASSY(121,1)=    0.040,    0.028,    0.020,    0.016,    0.013,    0.010,
ASSY(127,1)=    0.009,    0.007,    0.006,    0.006,    0.005,    0.004,
ASSY(133,1)=    0.004,    0.004,    0.003,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr400b.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      2.9174 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   2.21                               **
/COM, **    Burnup (MWd/MTU):       20000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   400.00,   398.36,   396.74,   395.12,   393.52,   391.93,
ASSY( 7,1)=   390.35,   388.79,   387.23,   385.65,   384.07,   376.33,
ASSY(13,1)=   368.87,   361.68,   354.73,   348.02,   341.54,   335.27,
ASSY(19,1)=   329.20,   323.34,   317.65,   312.15,   306.82,   301.64,
ASSY(25,1)=   296.63,   291.76,   287.04,   282.45,   277.99,   243.38,
ASSY(31,1)=   216.78,   198.07,   182.91,   172.21,   163.28,   156.63,
ASSY(37,1)=   150.88,   146.37,   142.36,   139.19,   136.35,   133.64,
ASSY(43,1)=   131.10,   128.99,   127.06,   125.29,   123.63,   111.03,
ASSY(49,1)=   101.74,    93.98,    87.23,    81.17,    75.75,    70.87,
ASSY(55,1)=    66.51,    62.55,    58.98,    55.74,    52.81,    50.16,
ASSY(61,1)=    47.75,    45.58,    43.59,    41.80,    40.26,    30.11,
ASSY(67,1)=    25.50,    22.72,    20.81,    19.17,    17.85,    16.65,
ASSY(73,1)=    15.62,    14.57,    13.67,    12.89,    12.20,    11.47,
ASSY(79,1)=    10.83,    10.26,     9.75,     9.29,     8.87,     5.84,
ASSY(85,1)=     4.44,     3.73,     3.36,     3.15,     2.99,     2.88,
ASSY(91,1)=     2.79,     2.68,     2.59,     2.51,     2.44,     2.36,
ASSY(97,1)=     2.29,     2.23,     2.17,     2.12,     2.07,     1.55,
ASSY(103,1)=     1.27,    0.996,    0.819,    0.694,    0.601,    0.530,
ASSY(109,1)=    0.473,    0.409,    0.359,    0.318,    0.284,    0.256,
ASSY(115,1)=    0.232,    0.212,    0.194,    0.179,    0.166,    0.090,
ASSY(121,1)=    0.058,    0.041,    0.031,    0.025,    0.020,    0.017,
ASSY(127,1)=    0.015,    0.013,    0.011,    0.010,    0.009,    0.008,
ASSY(133,1)=    0.007,    0.007,    0.006,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr400c.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      3.9422 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   2.93                               **
/COM, **    Burnup (MWd/MTU):       30000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   400.00,   398.91,   397.83,   396.76,   395.69,   394.63,
ASSY( 7,1)=   393.60,   392.68,   391.77,   390.86,   389.95,   385.49,
ASSY(13,1)=   381.14,   376.88,   372.73,   368.66,   364.69,   360.80,
ASSY(19,1)=   357.00,   353.28,   349.64,   346.08,   342.59,   339.17,
ASSY(25,1)=   335.83,   332.55,   329.33,   326.18,   323.10,   298.64,
ASSY(31,1)=   278.35,   263.59,   250.96,   241.27,   232.73,   225.86,
ASSY(37,1)=   219.68,   214.86,   210.49,   206.05,   201.87,   198.44,
ASSY(43,1)=   195.27,   192.37,   189.63,   187.07,   184.65,   165.27,
ASSY(49,1)=   150.51,   138.03,   127.28,   117.64,   109.03,   101.34,
ASSY(55,1)=    94.46,    88.31,    82.76,    77.77,    73.27,    69.22,
ASSY(61,1)=    65.56,    62.26,    59.25,    56.55,    54.19,    38.95,
ASSY(67,1)=    32.09,    28.08,    25.44,    23.26,    21.51,    20.00,
ASSY(73,1)=    18.72,    17.43,    16.34,    15.39,    14.55,    13.69,
ASSY(79,1)=    12.93,    12.26,    11.66,    11.12,    10.62,     7.04,
ASSY(85,1)=     5.38,     4.53,     4.09,     3.83,     3.62,     3.49,
ASSY(91,1)=     3.37,     3.24,     3.13,     3.02,     2.93,     2.83,
ASSY(97,1)=     2.75,     2.67,     2.59,     2.52,     2.46,     1.82,
ASSY(103,1)=     1.47,     1.15,    0.943,    0.797,    0.689,    0.606,
ASSY(109,1)=    0.540,    0.472,    0.418,    0.373,    0.336,    0.305,
ASSY(115,1)=    0.279,    0.256,    0.236,    0.219,    0.204,    0.115,
ASSY(121,1)=    0.077,    0.056,    0.043,    0.035,    0.029,    0.025,
ASSY(127,1)=    0.021,    0.019,    0.016,    0.015,    0.013,    0.012,
ASSY(133,1)=    0.011,    0.010,    0.009,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr400d.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      7.8481 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.44                               **
/COM, **    Burnup (MWd/MTU):       40000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   400.00,   399.72,   399.44,   399.16,   398.88,   398.60,
ASSY( 7,1)=   398.33,   398.05,   397.77,   397.50,   397.22,   395.85,
ASSY(13,1)=   394.63,   393.42,   392.23,   391.04,   389.87,   388.70,
ASSY(19,1)=   387.55,   386.41,   385.27,   384.15,   383.04,   381.93,
ASSY(25,1)=   380.84,   379.76,   378.68,   377.61,   376.56,   367.33,
ASSY(31,1)=   359.17,   351.56,   344.46,   338.13,   332.30,   326.92,
ASSY(37,1)=   321.88,   317.16,   312.71,   308.67,   304.91,   300.93,
ASSY(43,1)=   296.97,   293.37,   290.00,   286.64,   283.37,   255.74,
ASSY(49,1)=   232.65,   213.14,   195.85,   180.63,   167.18,   155.10,
ASSY(55,1)=   144.48,   135.01,   126.54,   118.92,   112.08,   105.90,
ASSY(61,1)=   100.34,    95.32,    90.77,    86.80,    83.05,    59.48,
ASSY(67,1)=    48.20,    41.37,    36.87,    33.27,    30.43,    28.12,
ASSY(73,1)=    26.16,    24.33,    22.76,    21.41,    20.20,    19.02,
ASSY(79,1)=    17.97,    17.05,    16.21,    15.46,    14.77,     9.88,
ASSY(85,1)=     7.62,     6.45,     5.82,     5.46,     5.16,     4.97,
ASSY(91,1)=     4.81,     4.61,     4.44,     4.28,     4.15,     4.00,
ASSY(97,1)=     3.88,     3.76,     3.65,     3.56,     3.46,     2.53,
ASSY(103,1)=     2.03,     1.58,     1.30,     1.09,    0.945,    0.831,
ASSY(109,1)=    0.740,    0.653,    0.583,    0.525,    0.476,    0.435,
ASSY(115,1)=    0.400,    0.370,    0.343,    0.320,    0.299,    0.176,
ASSY(121,1)=    0.121,    0.090,    0.071,    0.058,    0.049,    0.042,
ASSY(127,1)=    0.036,    0.032,    0.029,    0.026,    0.024,    0.021,
ASSY(133,1)=    0.020,    0.018,    0.017,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr400e.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      10.9614 (RHBIII)                   **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.74                               **
/COM, **    Burnup (MWd/MTU):       50000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   400.00,   399.84,   399.69,   399.53,   399.38,   399.23,
ASSY( 7,1)=   399.09,   398.94,   398.79,   398.65,   398.50,   397.78,
ASSY(13,1)=   397.06,   396.34,   395.63,   394.92,   394.22,   393.52,
ASSY(19,1)=   392.82,   392.13,   391.45,   390.76,   390.09,   389.41,
ASSY(25,1)=   388.74,   388.08,   387.41,   386.76,   386.10,   379.90,
ASSY(31,1)=   374.04,   368.57,   363.39,   358.65,   354.14,   349.36,
ASSY(37,1)=   344.75,   340.53,   336.50,   332.62,   328.88,   325.21,
ASSY(43,1)=   321.67,   318.58,   315.62,   312.11,   308.66,   279.40,
ASSY(49,1)=   254.59,   232.95,   214.14,   197.40,   182.67,   169.49,
ASSY(55,1)=   157.90,   147.54,   138.25,   129.92,   122.43,   115.71,
ASSY(61,1)=   109.62,   104.12,    99.43,    94.79,    90.69,    64.68,
ASSY(67,1)=    51.94,    44.20,    39.13,    35.11,    31.97,    29.48,
ASSY(73,1)=    27.37,    25.45,    23.82,    22.40,    21.13,    19.93,
ASSY(79,1)=    18.87,    17.92,    17.07,    16.30,    15.58,    10.60,
ASSY(85,1)=     8.29,     7.07,     6.41,     6.02,     5.70,     5.49,
ASSY(91,1)=     5.30,     5.08,     4.88,     4.71,     4.56,     4.40,
ASSY(97,1)=     4.25,     4.12,     4.00,     3.89,     3.79,     2.75,
ASSY(103,1)=     2.18,     1.71,     1.39,     1.18,     1.01,    0.889,
ASSY(109,1)=   0.791,    0.702,    0.630,    0.570,    0.519,    0.476,
ASSY(115,1)=   0.439,    0.407,    0.379,    0.354,    0.332,    0.200,
ASSY(121,1)=   0.139,    0.105,    0.084,    0.069,    0.058,    0.050,
ASSY(127,1)=   0.044,    0.039,    0.035,    0.032,    0.029,    0.027,
ASSY(133,1)=   0.024,    0.023,    0.021,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

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/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr520a.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      1.5742 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   1.30                               **
/COM, **    Burnup (MWd/MTU):       10000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   520.00,   516.39,   512.82,   509.30,   505.83,   502.40,
ASSY( 7,1)=   499.02,   495.68,   492.38,   489.12,   485.91,   470.42,
ASSY(13,1)=   455.84,   442.10,   429.14,   416.88,   405.27,   393.03,
ASSY(19,1)=   380.19,   368.06,   356.59,   345.72,   335.42,   325.63,
ASSY(25,1)=   316.34,   307.49,   299.06,   291.03,   283.36,   222.01,
ASSY(31,1)=   178.16,   147.60,   126.95,   111.29,   100.67,    92.14,
ASSY(37,1)=    86.44,    81.65,    78.28,    75.34,    73.16,    71.21,
ASSY(43,1)=    69.73,    68.36,    67.11,    65.97,    65.02,    58.46,
ASSY(49,1)=    54.00,    50.40,    47.28,    44.46,    41.91,    39.58,
ASSY(55,1)=    37.47,    35.56,    33.81,    32.22,    30.78,    29.46,
ASSY(61,1)=    28.26,    27.17,    26.17,    25.26,    24.48,    19.24,
ASSY(67,1)=    16.77,    15.22,    14.10,    13.09,    12.27,    11.50,
ASSY(73,1)=    10.84,    10.14,     9.55,     9.03,     8.58,     8.09,
ASSY(79,1)=     7.66,     7.27,     6.93,     6.62,     6.33,     4.28,
ASSY(85,1)=     3.32,     2.84,     2.58,     2.44,     2.32,     2.25,
ASSY(91,1)=     2.18,     2.11,     2.04,     1.98,     1.93,     1.87,
ASSY(97,1)=     1.82,     1.77,     1.73,     1.69,     1.65,     1.27,
ASSY(103,1)=     1.05,    0.827,    0.682,    0.580,    0.503,    0.444,
ASSY(109,1)=    0.398,    0.339,    0.294,    0.257,    0.228,    0.203,
ASSY(115,1)=    0.182,    0.165,    0.150,    0.137,    0.126,    0.064,
ASSY(121,1)=    0.040,    0.028,    0.020,    0.016,    0.013,    0.010,
ASSY(127,1)=    0.009,    0.007,    0.006,    0.006,    0.005,    0.004,
ASSY(133,1)=    0.004,    0.004,    0.003,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr520b.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      2.3440 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   2.21                               **
/COM, **    Burnup (MWd/MTU):       20000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   520.01,   517.36,   514.74,   512.14,   509.57,   507.02,
ASSY( 7,1)=   504.49,   501.98,   499.50,   497.04,   494.60,   482.74,
ASSY(13,1)=   471.39,   460.51,   450.09,   440.09,   430.49,   421.27,
ASSY(19,1)=   412.41,   403.88,   395.67,   387.76,   379.92,   372.33,
ASSY(25,1)=   365.01,   357.95,   351.13,   344.54,   338.17,   284.58,
ASSY(31,1)=   247.82,   220.33,   200.52,   184.98,   173.63,   164.52,
ASSY(37,1)=   157.52,   151.69,   146.98,   142.93,   139.63,   136.76,
ASSY(43,1)=   134.03,   131.47,   129.29,   127.33,   125.54,   112.24,
ASSY(49,1)=   102.70,    94.82,    87.97,    81.84,    76.34,    71.39,
ASSY(55,1)=    66.99,    62.99,    59.38,    56.09,    53.13,    50.45,
ASSY(61,1)=    48.02,    45.81,    43.81,    42.00,    40.44,    30.18,
ASSY(67,1)=    25.53,    22.74,    20.84,    19.19,    17.86,    16.66,
ASSY(73,1)=    15.64,    14.58,    13.68,    12.90,    12.21,    11.48,
ASSY(79,1)=    10.84,    10.27,     9.76,     9.30,     8.88,     5.84,
ASSY(85,1)=     4.44,     3.73,     3.36,     3.15,     2.99,     2.88,
ASSY(91,1)=     2.79,     2.68,     2.59,     2.51,     2.44,     2.36,
ASSY(97,1)=     2.29,     2.23,     2.17,     2.12,     2.07,     1.55,
ASSY(103,1)=     1.27,    0.996,    0.819,    0.694,    0.601,    0.530,
ASSY(109,1)=    0.473,    0.409,    0.359,    0.318,    0.284,    0.256,
ASSY(115,1)=    0.232,    0.212,    0.194,    0.179,    0.166,    0.090,
ASSY(121,1)=    0.058,    0.041,    0.031,    0.025,    0.020,    0.017,
ASSY(127,1)=    0.015,    0.013,    0.011,    0.010,    0.009,    0.008,
ASSY(133,1)=    0.007,    0.007,    0.006,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr520c.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      3.0870 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   2.93                               **
/COM, **    Burnup (MWd/MTU):       30000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   520.00,   518.20,   516.41,   514.64,   512.87,   511.12,
ASSY( 7,1)=   509.37,   507.64,   505.92,   504.21,   502.52,   494.19,
ASSY(13,1)=   486.13,   478.32,   470.75,   463.41,   456.28,   449.36,
ASSY(19,1)=   442.65,   436.12,   429.78,   423.61,   417.61,   411.78,
ASSY(25,1)=   406.10,   400.57,   395.18,   390.42,   385.95,   346.45,
ASSY(31,1)=   315.22,   292.43,   273.60,   259.77,   247.90,   238.71,
ASSY(37,1)=   230.59,   224.02,   218.16,   213.56,   209.20,   204.81,
ASSY(43,1)=   200.80,   197.50,   194.41,   191.56,   188.87,   168.12,
ASSY(49,1)=   152.84,   140.03,   129.06,   119.20,   110.43,   102.61,
ASSY(55,1)=    95.58,    89.32,    83.67,    78.60,    74.02,    69.89,
ASSY(61,1)=    66.16,    62.79,    59.75,    56.99,    54.60,    39.10,
ASSY(67,1)=    32.18,    28.13,    25.49,    23.29,    21.54,    20.02,
ASSY(73,1)=    18.74,    17.45,    16.35,    15.40,    14.57,    13.71,
ASSY(79,1)=    12.95,    12.27,    11.67,    11.13,    10.63,     7.04,
ASSY(85,1)=     5.38,     4.53,     4.09,     3.83,     3.63,     3.49,
ASSY(91,1)=     3.38,     3.24,     3.13,     3.02,     2.93,     2.83,
ASSY(97,1)=     2.75,     2.67,     2.59,     2.52,     2.46,     1.82,
ASSY(103,1)=     1.47,     1.15,    0.943,    0.797,    0.689,    0.606,
ASSY(109,1)=    0.540,    0.472,    0.418,    0.373,    0.336,    0.305,
ASSY(115,1)=    0.279,    0.256,    0.236,    0.219,    0.204,    0.115,
ASSY(121,1)=    0.077,    0.056,    0.043,    0.035,    0.029,    0.025,
ASSY(127,1)=    0.021,    0.019,    0.016,    0.015,    0.013,    0.012,
ASSY(133,1)=    0.011,    0.010,    0.009,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D     **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr520d.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      5.2248 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.44                               **
/COM, **    Burnup (MWd/MTU):       40000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   520.00,   519.26,   518.53,   517.80,   517.07,   516.35,
ASSY( 7,1)=   515.62,   514.90,   514.18,   513.47,   512.75,   509.22,
ASSY(13,1)=   505.74,   502.32,   498.95,   495.64,   492.37,   489.16,
ASSY(19,1)=   486.00,   482.88,   479.81,   476.78,   473.80,   470.86,
ASSY(25,1)=   468.18,   465.75,   463.36,   460.99,   458.66,   436.89,
ASSY(31,1)=   418.65,   403.50,   390.41,   379.18,   369.45,   361.12,
ASSY(37,1)=   353.39,   346.17,   339.62,   333.71,   328.21,   323.10,
ASSY(43,1)=   318.30,   313.79,   309.63,   305.82,   301.94,   269.86,
ASSY(49,1)=   244.34,   223.44,   204.62,   188.37,   174.03,   161.61,
ASSY(55,1)=   149.90,   139.85,   130.87,   122.81,   115.57,   109.06,
ASSY(61,1)=   103.19,    97.89,    93.10,    89.15,    84.97,    60.25,
ASSY(67,1)=    48.65,    41.64,    37.08,    33.44,    30.57,    28.23,
ASSY(73,1)=    26.27,    24.41,    22.84,    21.47,    20.27,    19.08,
ASSY(79,1)=    18.03,    17.09,    16.25,    15.50,    14.81,     9.89,
ASSY(85,1)=     7.63,     6.46,     5.83,     5.46,     5.17,     4.97,
ASSY(91,1)=     4.81,     4.61,     4.44,     4.28,     4.15,     4.00,
ASSY(97,1)=     3.88,     3.76,     3.65,     3.56,     3.46,     2.53,
ASSY(103,1)=     2.03,     1.58,     1.30,     1.09,    0.945,    0.831,
ASSY(109,1)=    0.740,    0.653,    0.583,    0.525,    0.477,    0.435,
ASSY(115,1)=    0.400,    0.370,    0.343,    0.320,    0.299,    0.176,
ASSY(121,1)=    0.121,    0.090,    0.071,    0.058,    0.049,    0.042,
ASSY(127,1)=    0.036,    0.032,    0.029,    0.026,    0.024,    0.021,
ASSY(133,1)=    0.020,    0.018,    0.017,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** History of SNF Assembly Heat Generation Rates                 **
/COM, ** Output of PHIA, SCSI: B00000000-01717-1200-3000X Rev.00D      **
/COM, **                                                               **
/COM, **    Executable File Name:   PHIA00D.EXE                        **
/COM, **    Output File Name:       bwr520e.dat                        **
/COM, **    Execution Date:         08/12/97                           **
/COM, **    Start Age (years):      6.4042 (RHBIII)                    **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Default average enrichment for the burnup specified        **
/COM, **    Enrichment (percent):   3.74                               **
/COM, **    Burnup (MWd/MTU):       50000                              **
/COM, **    Assembly Type:          BWR                                **
/COM, **    SNF U Mass (MTU/assy):  0.200                              **
/COM, **                                                               **
/COM, ** ASSY(#,1) is the SNF assembly heat in Watts.                  **
/COM, ** ASSY(#,0) is the time post emplacement in years.              **
/COM, ******************************************************************
*SET,ASSY,
*DIM,ASSY,TABLE,135,1,
ASSY( 1,1)=   520.00,   519.52,   519.04,   518.57,   518.09,   517.62,
ASSY( 7,1)=   517.15,   516.67,   516.20,   515.73,   515.27,   512.94,
ASSY(13,1)=   510.65,   508.38,   506.14,   503.92,   501.73,   499.57,
ASSY(19,1)=   497.43,   495.32,   493.24,   491.39,   489.56,   487.75,
ASSY(25,1)=   485.96,   484.19,   482.44,   480.70,   478.99,   462.74,
ASSY(31,1)=   449.17,   437.01,   426.86,   417.68,   409.02,   400.90,
ASSY(37,1)=   393.62,   386.85,   380.59,   374.69,   369.18,   363.97,
ASSY(43,1)=   359.18,   354.64,   349.90,   345.26,   341.00,   305.76,
ASSY(49,1)=   276.98,   252.51,   231.16,   212.53,   196.01,   181.39,
ASSY(55,1)=   168.41,   156.93,   146.67,   137.47,   129.22,   121.81,
ASSY(61,1)=   115.14,   109.12,   103.66,    98.97,    94.41,    66.21,
ASSY(67,1)=    52.83,    44.74,    39.55,    35.43,    32.22,    29.69,
ASSY(73,1)=    27.57,    25.62,    23.95,    22.52,    21.25,    20.04,
ASSY(79,1)=    18.96,    18.00,    17.14,    16.37,    15.65,    10.63,
ASSY(85,1)=     8.30,     7.08,     6.41,     6.02,     5.70,     5.49,
ASSY(91,1)=     5.30,     5.08,     4.89,     4.71,     4.56,     4.40,
ASSY(97,1)=     4.25,     4.12,     4.00,     3.89,     3.79,     2.75,
ASSY(103,1)=     2.19,     1.71,     1.39,     1.18,     1.01,    0.890,
ASSY(109,1)=    0.791,    0.702,    0.630,    0.570,    0.519,    0.476,
ASSY(115,1)=    0.439,    0.407,    0.379,    0.354,    0.332,    0.200,
ASSY(121,1)=    0.139,    0.105,    0.084,    0.069,    0.058,    0.050,
ASSY(127,1)=    0.044,    0.039,    0.035,    0.032,    0.029,    0.027,
ASSY(133,1)=    0.024,    0.023,    0.021,
ASSY( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ASSY( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ASSY(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ASSY(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ASSY(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ASSY(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ASSY(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ASSY(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ASSY(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ASSY(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ASSY(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ASSY(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ASSY(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ASSY(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ASSY(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ASSY(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ASSY(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ASSY(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ASSY(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ASSY(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ASSY(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ASSY(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ASSY(133,0)= 800000.00, 850000.00, 900000.00,
ASSY( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBINOOD, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBINOOD.EXE                       **
/COM, **    Input File Name:        case1.wsm                          **
/COM, **    Output File Name:       case1.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   124269                             **
/COM, **    Ave Age:                27.046                             **
/COM, **    Ave Burnup:             32392.993                          **
/COM, **    Ave Enrichment:         3.015                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   174.51,   174.46,   174.41,   174.36,   174.31,   174.26,
ABWR( 7,1)=   174.20,   174.15,   174.10,   174.05,   174.00,   173.75,
ABWR(13,1)=   173.50,   173.25,   173.00,   172.76,   172.51,   172.27,
ABWR(19,1)=   172.02,   171.78,   171.54,   171.30,   171.07,   170.83,
ABWR(25,1)=   170.59,   170.36,   170.13,   169.90,   169.67,   167.52,
ABWR(31,1)=   165.47,   163.53,   161.67,   159.90,   158.20,   156.58,
ABWR(37,1)=   155.03,   153.39,   151.82,   150.34,   148.91,   147.49,
ABWR(43,1)=   146.12,   144.78,   143.48,   142.23,   141.03,   129.30,
ABWR(49,1)=   119.29,   110.31,   102.44,    95.43,    89.25,    83.56,
ABWR(55,1)=    78.56,    74.06,    70.02,    66.38,    63.12,    60.13,
ABWR(61,1)=    57.43,    55.00,    52.86,    50.78,    48.93,    37.13,
ABWR(67,1)=    31.05,    27.28,    24.60,    22.45,    20.69,    19.24,
ABWR(73,1)=    17.92,    16.72,    15.69,    14.80,    13.96,    13.16,
ABWR(79,1)=    12.46,    11.83,    11.26,    10.75,    10.26,     6.90,
ABWR(85,1)=     5.34,     4.53,     4.10,     3.85,     3.65,     3.51,
ABWR(91,1)=     3.40,     3.26,     3.14,     3.04,     2.94,     2.85,
ABWR(97,1)=     2.76,     2.68,     2.60,     2.53,     2.47,     1.82,
ABWR(103,1)=     1.46,     1.15,    0.941,    0.795,    0.687,    0.604,
ABWR(109,1)=    0.539,    0.473,    0.420,    0.376,    0.340,    0.310,
ABWR(115,1)=    0.283,    0.261,    0.241,    0.224,    0.209,    0.120,
ABWR(121,1)=    0.081,    0.060,    0.047,    0.038,    0.032,    0.027,
ABWR(127,1)=    0.023,    0.021,    0.018,    0.016,    0.015,    0.014,
ABWR(133,1)=    0.012,    0.011,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

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/COM, **                                                                **
/COM, **    Assembly Type:          PWR                                 **
/COM, **    Decay Period (years):   900000                              **
/COM, **    Number of assemblies:   94847                               **
/COM, **    Ave Age:                26.098                              **
/COM, **    Ave Burnup:             39494.778                           **
/COM, **    Ave Enrichment:         3.696                               **
/COM, **    Ave MTU/assy:           0.432                               **
/COM, **
/COM, ***********************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   476.02,   475.88,   475.74,   475.60,   475.46,   475.32,
APWR( 7,1)=   475.18,   475.04,   474.90,   474.76,   474.62,   473.92,
APWR(13,1)=   473.23,   472.54,   471.86,   471.18,   470.50,   469.83,
APWR(19,1)=   469.16,   468.49,   467.83,   467.17,   466.52,   465.87,
APWR(25,1)=   465.22,   464.57,   463.93,   463.29,   462.66,   456.77,
APWR(31,1)=   451.15,   445.81,   440.69,   435.82,   431.14,   426.68,
APWR(37,1)=   422.38,   417.84,   413.46,   409.41,   405.49,   401.61,
APWR(43,1)=   397.85,   394.15,   390.56,   387.13,   383.79,   351.35,
APWR(49,1)=   323.69,   298.88,   277.05,   257.58,   240.36,   224.61,
APWR(55,1)=   210.65,   198.11,   186.82,   176.66,   167.53,   159.20,
APWR(61,1)=   151.69,   144.89,   138.85,   133.12,   128.00,    95.59,
APWR(67,1)=    79.32,    69.55,    62.70,    57.26,    52.86,    49.22,
APWR(73,1)=    45.95,    42.97,    40.41,    38.18,    36.08,    34.11,
APWR(79,1)=    32.37,    30.80,    29.39,    28.12,    26.89,    18.53,
APWR(85,1)=    14.60,    12.55,    11.43,    10.76,    10.22,     9.85,
APWR(91,1)=     9.53,     9.15,     8.82,     8.53,     8.26,     7.98,
APWR(97,1)=     7.73,     7.50,     7.29,     7.10,     6.92,     5.09,
APWR(103,1)=     4.10,     3.21,     2.63,     2.22,     1.92,     1.68,
APWR(109,1)=     1.50,     1.31,     1.16,     1.04,    0.939,    0.854,
APWR(115,1)=    0.780,    0.717,    0.662,    0.614,    0.572,    0.326,
APWR(121,1)=    0.219,    0.160,    0.125,    0.101,    0.084,    0.071,
APWR(127,1)=    0.061,    0.054,    0.048,    0.043,    0.039,    0.035,
APWR(133,1)=    0.032,    0.029,    0.027,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ***********************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case2.wsm                          **
/COM, **    Output File Name:       case2.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   125541                             **
/COM, **    Ave Age:                25.399                             **
/COM, **    Ave Burnup:             32723.921                          **
/COM, **    Ave Enrichment:         3.070                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   181.38,   181.32,   181.27,   181.21,   181.15,   181.10,
ABWR( 7,1)=   181.04,   180.99,   180.93,   180.88,   180.82,   180.54,
ABWR(13,1)=   180.27,   179.99,   179.72,   179.45,   179.18,   178.91,
ABWR(19,1)=   178.65,   178.38,   178.12,   177.86,   177.60,   177.34,
ABWR(25,1)=   177.08,   176.83,   176.57,   176.32,   176.07,   173.73,
ABWR(31,1)=   171.52,   169.42,   167.42,   165.52,   163.70,   161.98,
ABWR(37,1)=   160.32,   158.58,   156.90,   155.34,   153.83,   152.33,
ABWR(43,1)=   150.89,   149.48,   148.11,   146.81,   145.55,   133.24,
ABWR(49,1)=   122.80,   113.44,   105.24,    97.93,    91.52,    85.60,
ABWR(55,1)=    80.39,    75.73,    71.53,    67.75,    64.36,    61.26,
ABWR(61,1)=    58.47,    55.93,    53.74,    51.57,    49.66,    37.49,
ABWR(67,1)=    31.26,    27.42,    24.71,    22.53,    20.76,    19.29,
ABWR(73,1)=    17.97,    16.77,    15.73,    14.84,    13.99,    13.19,
ABWR(79,1)=    12.49,    11.86,    11.29,    10.78,    10.29,     6.92,
ABWR(85,1)=     5.36,     4.55,     4.12,     3.87,     3.66,     3.53,
ABWR(91,1)=     3.41,     3.28,     3.16,     3.05,     2.96,     2.86,
ABWR(97,1)=     2.77,     2.69,     2.61,     2.54,     2.48,     1.82,
ABWR(103,1)=     1.47,     1.15,    0.944,    0.798,    0.689,    0.606,
ABWR(109,1)=    0.540,    0.475,    0.422,    0.378,    0.342,    0.311,
ABWR(115,1)=    0.285,    0.262,    0.243,    0.226,    0.210,    0.121,
ABWR(121,1)=    0.082,    0.061,    0.047,    0.039,    0.032,    0.027,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
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/COM, **                                                                **
/COM, **    Assembly Type:          PWR                                 **
/COM, **    Decay Period (years):   900000                              **
/COM, **    Number of assemblies:   94631                               **
/COM, **    Ave Age:                25.100                              **
/COM, **    Ave Burnup:             39557.358                           **
/COM, **    Ave Enrichment:         3.716                               **
/COM, **    Ave MTU/assy:           0.432                               **
/COM, **                                                                **
/COM, ************************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   483.64,   483.49,   483.34,   483.20,   483.05,   482.91,
APWR( 7,1)=   482.76,   482.62,   482.47,   482.33,   482.18,   481.46,
APWR(13,1)=   480.74,   480.03,   479.32,   478.61,   477.91,   477.21,
APWR(19,1)=   476.52,   475.83,   475.14,   474.46,   473.78,   473.10,
APWR(25,1)=   472.43,   471.76,   471.09,   470.43,   469.77,   463.67,
APWR(31,1)=   457.86,   452.36,   447.08,   442.06,   437.24,   432.66,
APWR(37,1)=   428.25,   423.60,   419.11,   414.96,   410.95,   406.99,
APWR(43,1)=   403.14,   399.36,   395.69,   392.19,   388.79,   355.68,
APWR(49,1)=   327.54,   302.28,   280.08,   260.27,   242.78,   226.76,
APWR(55,1)=   212.57,   199.83,   188.36,   178.04,   168.76,   160.31,
APWR(61,1)=   152.67,   145.77,   139.66,   133.84,   128.64,    95.82,
APWR(67,1)=    79.41,    69.58,    62.72,    57.26,    52.85,    49.21,
APWR(73,1)=    45.94,    42.96,    40.39,    38.16,    36.07,    34.10,
APWR(79,1)=    32.35,    30.79,    29.38,    28.11,    26.88,    18.52,
APWR(85,1)=    14.60,    12.54,    11.43,    10.76,    10.22,     9.85,
APWR(91,1)=     9.52,     9.15,     8.82,     8.52,     8.26,     7.98,
APWR(97,1)=     7.73,     7.50,     7.29,     7.10,     6.92,     5.09,
APWR(103,1)=    4.10,     3.21,     2.63,     2.22,     1.92,     1.68,
APWR(109,1)=    1.50,     1.31,     1.16,     1.04,    0.940,    0.854,
APWR(115,1)=   0.780,    0.717,    0.663,    0.615,    0.572,    0.326,
APWR(121,1)=   0.219,    0.161,    0.125,    0.101,    0.084,    0.071,
APWR(127,1)=   0.061,    0.054,    0.048,    0.043,    0.039,    0.035,
APWR(133,1)=   0.032,    0.029,    0.027,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ************************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case3.wsm                          **
/COM, **    Output File Name:       case3.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   125489                             **
/COM, **    Ave Age:                21.172                             **
/COM, **    Ave Burnup:             33818.206                          **
/COM, **    Ave Enrichment:         3.163                              **
/COM, **    Ave MTU/assy:           0.176                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   202.47,   202.40,   202.33,   202.27,   202.20,   202.14,
ABWR( 7,1)=   202.07,   202.01,   201.94,   201.88,   201.81,   201.49,
ABWR(13,1)=   201.17,   200.85,   200.53,   200.22,   199.90,   199.59,
ABWR(19,1)=   199.28,   198.97,   198.67,   198.36,   198.06,   197.76,
ABWR(25,1)=   197.46,   197.16,   196.87,   196.57,   196.28,   193.55,
ABWR(31,1)=   190.97,   188.53,   186.21,   183.99,   181.86,   179.86,
ABWR(37,1)=   177.94,   175.94,   174.01,   172.20,   170.47,   168.75,
ABWR(43,1)=   167.09,   165.46,   163.89,   162.38,   160.93,   146.84,
ABWR(49,1)=   134.94,   124.29,   114.98,   106.71,    99.45,    92.77,
ABWR(55,1)=    86.91,    81.66,    76.93,    72.68,    68.86,    65.40,
ABWR(61,1)=    62.28,    59.46,    57.01,    54.60,    52.48,    39.00,
ABWR(67,1)=    32.26,    28.13,    25.28,    22.99,    21.15,    19.63,
ABWR(73,1)=    18.29,    17.05,    15.99,    15.07,    14.22,    13.41,
ABWR(79,1)=    12.69,    12.05,    11.47,    10.95,    10.46,     7.04,
ABWR(85,1)=     5.46,     4.64,     4.20,     3.94,     3.73,     3.60,
ABWR(91,1)=     3.48,     3.34,     3.22,     3.11,     3.01,     2.91,
ABWR(97,1)=     2.82,     2.74,     2.66,     2.59,     2.52,     1.86,
ABWR(103,1)=     1.49,     1.17,    0.959,    0.811,    0.701,    0.616,
ABWR(109,1)=    0.549,    0.483,    0.429,    0.385,    0.349,    0.318,
ABWR(115,1)=    0.291,    0.268,    0.248,    0.231,    0.216,    0.125,
ABWR(121,1)=    0.085,    0.063,    0.049,    0.040,    0.034,    0.029,
ABWR(127,1)=    0.025,    0.022,    0.019,    0.018,    0.016,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
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/COM, **                                                          **
/COM, **    Assembly Type:          PWR                           **
/COM, **    Decay Period (years):   900000                        **
/COM, **    Number of assemblies:   94794                         **
/COM, **    Ave Age:                21.004                        **
/COM, **    Ave Burnup:             40596.840                     **
/COM, **    Ave Enrichment:         3.817                         **
/COM, **    Ave MTU/assy:           0.432                         **
/COM, **                                                          **
/COM, ******************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   536.19,   536.02,   535.85,   535.68,   535.51,   535.34,
APWR( 7,1)=   535.17,   535.00,   534.83,   534.65,   534.49,   533.64,
APWR(13,1)=   532.80,   531.97,   531.14,   530.31,   529.49,   528.67,
APWR(19,1)=   527.86,   527.06,   526.25,   525.46,   524.66,   523.87,
APWR(25,1)=   523.09,   522.31,   521.53,   520.76,   519.99,   512.87,
APWR(31,1)=   506.11,   499.71,   493.59,   487.79,   482.22,   476.95,
APWR(37,1)=   471.87,   466.53,   461.38,   456.64,   452.05,   447.52,
APWR(43,1)=   443.13,   438.82,   434.63,   430.65,   426.78,   389.27,
APWR(49,1)=   357.51,   329.10,   304.16,   281.97,   262.40,   244.48,
APWR(55,1)=   228.66,   214.45,   201.68,   190.17,   179.80,   170.44,
APWR(61,1)=   161.98,   154.35,   147.60,   141.16,   135.42,    99.35,
APWR(67,1)=    81.68,    71.18,    64.01,    58.33,    53.76,    50.01,
APWR(73,1)=    46.68,    43.63,    41.01,    38.73,    36.62,    34.62,
APWR(79,1)=    32.84,    31.26,    29.83,    28.54,    27.31,    18.83,
APWR(85,1)=    14.87,    12.78,    11.65,    10.97,    10.42,    10.04,
APWR(91,1)=     9.71,     9.33,     8.99,     8.68,     8.41,     8.13,
APWR(97,1)=     7.87,     7.64,     7.43,     7.23,     7.04,     5.18,
APWR(103,1)=    4.16,     3.26,     2.67,     2.25,     1.95,     1.71,
APWR(109,1)=    1.52,     1.33,     1.18,     1.06,    0.957,    0.870,
APWR(115,1)=   0.796,    0.732,    0.676,    0.628,    0.585,    0.334,
APWR(121,1)=   0.225,    0.165,    0.129,    0.104,    0.087,    0.074,
APWR(127,1)=   0.064,    0.056,    0.050,    0.044,    0.040,    0.036,
APWR(133,1)=   0.033,    0.031,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case4.wsm                          **
/COM, **    Output File Name:       case4.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   125509                             **
/COM, **    Ave Age:                21.173                             **
/COM, **    Ave Burnup:             33818.961                          **
/COM, **    Ave Enrichment:         3.163                              **
/COM, **    Ave MTU/assy:           0.176                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   202.46,   202.39,   202.33,   202.26,   202.19,   202.13,
ABWR( 7,1)=   202.06,   202.00,   201.93,   201.87,   201.80,   201.48,
ABWR(13,1)=   201.16,   200.84,   200.52,   200.21,   199.90,   199.58,
ABWR(19,1)=   199.27,   198.97,   198.66,   198.36,   198.05,   197.75,
ABWR(25,1)=   197.45,   197.16,   196.86,   196.57,   196.27,   193.55,
ABWR(31,1)=   190.96,   188.53,   186.20,   183.98,   181.86,   179.86,
ABWR(37,1)=   177.94,   175.93,   174.00,   172.20,   170.47,   168.75,
ABWR(43,1)=   167.09,   165.46,   163.89,   162.38,   160.92,   146.84,
ABWR(49,1)=   134.93,   124.29,   114.98,   106.71,    99.45,    92.77,
ABWR(55,1)=    86.91,    81.66,    76.93,    72.68,    68.86,    65.40,
ABWR(61,1)=    62.28,    59.46,    57.01,    54.60,    52.48,    39.00,
ABWR(67,1)=    32.26,    28.13,    25.28,    22.99,    21.15,    19.63,
ABWR(73,1)=    18.29,    17.05,    15.99,    15.07,    14.22,    13.41,
ABWR(79,1)=    12.69,    12.05,    11.47,    10.95,    10.46,     7.04,
ABWR(85,1)=     5.46,     4.64,     4.20,     3.94,     3.73,     3.60,
ABWR(91,1)=     3.48,     3.34,     3.22,     3.11,     3.01,     2.91,
ABWR(97,1)=     2.82,     2.74,     2.66,     2.59,     2.52,     1.86,
ABWR(103,1)=     1.49,     1.17,    0.959,    0.811,    0.701,    0.616,
ABWR(109,1)=    0.549,    0.483,    0.429,    0.385,    0.349,    0.318,
ABWR(115,1)=    0.291,    0.268,    0.248,    0.231,    0.216,    0.125,
ABWR(121,1)=    0.085,    0.063,    0.049,    0.040,    0.034,    0.029,
ABWR(127,1)=    0.025,    0.022,    0.019,    0.018,    0.016,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     94761                             **
/COM, **    Ave Age:                  21.030                            **
/COM, **    Ave Burnup:               40595.598                         **
/COM, **    Ave Enrichment:           3.817                             **
/COM, **    Ave MTU/assy:             0.432                             **
/COM, **
/COM, ***********************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   535.93,   535.76,   535.59,   535.42,   535.25,   535.07,
APWR( 7,1)=   534.91,   534.74,   534.57,   534.40,   534.23,   533.38,
APWR(13,1)=   532.55,   531.72,   530.89,   530.06,   529.24,   528.43,
APWR(19,1)=   527.62,   526.81,   526.01,   525.22,   524.42,   523.64,
APWR(25,1)=   522.85,   522.07,   521.30,   520.53,   519.76,   512.65,
APWR(31,1)=   505.89,   499.50,   493.39,   487.59,   482.04,   476.76,
APWR(37,1)=   471.69,   466.35,   461.22,   456.48,   451.90,   447.36,
APWR(43,1)=   442.98,   438.67,   434.49,   430.50,   426.64,   389.15,
APWR(49,1)=   357.41,   329.00,   304.08,   281.89,   262.33,   244.43,
APWR(55,1)=   228.61,   214.41,   201.63,   190.13,   179.77,   170.41,
APWR(61,1)=   161.95,   154.32,   147.58,   141.14,   135.40,    99.34,
APWR(67,1)=    81.67,    71.18,    64.01,    58.32,    53.76,    50.01,
APWR(73,1)=    46.68,    43.63,    41.01,    38.73,    36.62,    34.62,
APWR(79,1)=    32.84,    31.26,    29.83,    28.54,    27.31,    18.83,
APWR(85,1)=    14.87,    12.78,    11.65,    10.97,    10.42,    10.04,
APWR(91,1)=     9.71,     9.33,     8.99,     8.69,     8.41,     8.13,
APWR(97,1)=     7.87,     7.64,     7.43,     7.23,     7.04,     5.18,
APWR(103,1)=    4.16,     3.26,     2.67,     2.25,     1.95,     1.71,
APWR(109,1)=    1.52,     1.34,     1.18,     1.06,    0.957,    0.870,
APWR(115,1)=   0.796,    0.732,    0.676,    0.628,    0.585,    0.334,
APWR(121,1)=   0.225,    0.165,    0.129,    0.104,    0.087,    0.074,
APWR(127,1)=   0.064,    0.056,    0.050,    0.044,    0.040,    0.036,
APWR(133,1)=   0.033,    0.031,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ***********************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case5.wsm                          **
/COM, **    Output File Name:       case5.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   124125                             **
/COM, **    Ave Age:                27.504                             **
/COM, **    Ave Burnup:             31765.858                          **
/COM, **    Ave Enrichment:         2.978                              **
/COM, **    Ave MTU/assy:           0.178                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   167.91,   167.87,   167.83,   167.79,   167.75,   167.71,
ABWR( 7,1)=   167.67,   167.62,   167.58,   167.54,   167.50,   167.30,
ABWR(13,1)=   167.09,   166.89,   166.69,   166.49,   166.29,   166.09,
ABWR(19,1)=   165.89,   165.69,   165.50,   165.30,   165.10,   164.91,
ABWR(25,1)=   164.72,   164.53,   164.33,   164.14,   163.96,   162.11,
ABWR(31,1)=   160.34,   158.63,   156.99,   155.39,   153.84,   152.33,
ABWR(37,1)=   150.87,   149.40,   147.97,   146.58,   145.23,   143.89,
ABWR(43,1)=   142.59,   141.31,   140.06,   138.83,   137.63,   126.42,
ABWR(49,1)=   116.62,   107.94,   100.28,    93.45,    87.33,    81.86,
ABWR(55,1)=    76.97,    72.59,    68.65,    65.09,    61.87,    58.96,
ABWR(61,1)=    56.34,    54.00,    51.84,    49.84,    48.04,    36.52,
ABWR(67,1)=    30.57,    26.89,    24.25,    22.14,    20.42,    18.99,
ABWR(73,1)=    17.69,    16.51,    15.49,    14.61,    13.78,    12.99,
ABWR(79,1)=    12.30,    11.68,    11.12,    10.62,    10.13,     6.81,
ABWR(85,1)=     5.27,     4.47,     4.05,     3.80,     3.60,     3.47,
ABWR(91,1)=     3.35,     3.22,     3.10,     3.00,     2.91,     2.81,
ABWR(97,1)=     2.72,     2.64,     2.57,     2.50,     2.44,     1.80,
ABWR(103,1)=     1.45,     1.14,    0.931,    0.787,    0.680,    0.598,
ABWR(109,1)=    0.533,    0.468,    0.415,    0.372,    0.336,    0.306,
ABWR(115,1)=    0.280,    0.257,    0.238,    0.221,    0.206,    0.118,
ABWR(121,1)=    0.080,    0.059,    0.046,    0.037,    0.031,    0.027,
ABWR(127,1)=    0.023,    0.020,    0.018,    0.016,    0.015,    0.013,
ABWR(133,1)=    0.012,    0.011,    0.010,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     94858                             **
/COM, **    Ave Age:                  27.080                            **
/COM, **    Ave Burnup:               38787.087                         **
/COM, **    Ave Enrichment:           3.642                             **
/COM, **    Ave MTU/assy:             0.432                             **
/COM, **                                                                **
/COM, ************************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   450.30,   450.20,   450.09,   449.98,   449.87,   449.77,
APWR( 7,1)=   449.66,   449.55,   449.44,   449.33,   449.23,   448.69,
APWR(13,1)=   448.15,   447.62,   447.09,   446.57,   446.04,   445.52,
APWR(19,1)=   445.00,   444.48,   443.97,   443.45,   442.94,   442.43,
APWR(25,1)=   441.92,   441.42,   440.92,   440.42,   439.92,   435.08,
APWR(31,1)=   430.42,   425.89,   421.53,   417.25,   413.13,   409.08,
APWR(37,1)=   405.16,   401.21,   397.38,   393.66,   390.04,   386.45,
APWR(43,1)=   382.95,   379.50,   376.14,   372.82,   369.59,   339.24,
APWR(49,1)=   312.65,   289.08,   268.20,   249.56,   232.87,   217.90,
APWR(55,1)=   204.50,   192.45,   181.62,   171.84,   162.99,   154.99,
APWR(61,1)=   147.79,   141.31,   135.37,   129.93,   124.98,    93.73,
APWR(67,1)=    77.95,    68.46,    61.77,    56.45,    52.13,    48.57,
APWR(73,1)=    45.33,    42.40,    39.88,    37.69,    35.61,    33.67,
APWR(79,1)=    31.94,    30.40,    29.01,    27.76,    26.54,    18.28,
APWR(85,1)=    14.40,    12.37,    11.27,    10.61,    10.08,     9.71,
APWR(91,1)=     9.40,     9.02,     8.70,     8.41,     8.15,     7.87,
APWR(97,1)=     7.63,     7.40,     7.20,     7.01,     6.83,     5.03,
APWR(103,1)=    4.05,     3.17,     2.60,     2.19,     1.89,     1.66,
APWR(109,1)=    1.48,     1.30,     1.15,     1.03,    0.927,    0.842,
APWR(115,1)=   0.769,    0.707,    0.653,    0.605,    0.564,    0.320,
APWR(121,1)=   0.215,    0.157,    0.122,    0.099,    0.082,    0.069,
APWR(127,1)=   0.060,    0.053,    0.047,    0.042,    0.038,    0.034,
APWR(133,1)=   0.031,    0.029,    0.027,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ************************************************************************
/EOF
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/COM, ****************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats         **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                             **
/COM, **    Executable File Name:   WPBIN00D.EXE                     **
/COM, **    Input File Name:        case6.wsm                        **
/COM, **    Output File Name:       case6.dat                        **
/COM, **    Execution Date:         08/11/97                         **
/COM, ****************************************************************
/COM, ****************************************************************
/COM, **                                                             **
/COM, **    Assembly Type:          BWR                              **
/COM, **    Decay Period (years):   900000                           **
/COM, **    Number of assemblies:   125084                           **
/COM, **    Ave Age:                26.571                           **
/COM, **    Ave Burnup:             32139.173                        **
/COM, **    Ave Enrichment:         3.011                            **
/COM, **    Ave MTU/assy:           0.177                            **
/COM, **                                                             **
/COM, ****************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   173.14,   173.10,   173.05,   173.01,   172.97,   172.92,
ABWR( 7,1)=   172.88,   172.83,   172.79,   172.74,   172.70,   172.48,
ABWR(13,1)=   172.26,   172.04,   171.82,   171.61,   171.39,   171.18,
ABWR(19,1)=   170.97,   170.75,   170.54,   170.33,   170.12,   169.91,
ABWR(25,1)=   169.71,   169.50,   169.30,   169.09,   168.89,   166.92,
ABWR(31,1)=   165.04,   163.22,   161.48,   159.79,   158.16,   156.57,
ABWR(37,1)=   155.03,   153.49,   152.00,   150.54,   149.14,   147.74,
ABWR(43,1)=   146.39,   145.06,   143.77,   142.49,   141.24,   129.60,
ABWR(49,1)=   119.48,   110.51,   102.59,    95.55,    89.25,    83.60,
ABWR(55,1)=    78.56,    74.05,    69.99,    66.32,    63.01,    60.02,
ABWR(61,1)=    57.32,    54.90,    52.69,    50.64,    48.78,    36.95,
ABWR(67,1)=    30.88,    27.12,    24.45,    22.31,    20.57,    19.12,
ABWR(73,1)=    17.81,    16.62,    15.60,    14.71,    13.87,    13.08,
ABWR(79,1)=    12.38,    11.76,    11.19,    10.69,    10.20,     6.86,
ABWR(85,1)=     5.31,     4.51,     4.08,     3.83,     3.63,     3.49,
ABWR(91,1)=     3.38,     3.24,     3.13,     3.02,     2.93,     2.83,
ABWR(97,1)=     2.74,     2.66,     2.59,     2.52,     2.45,     1.81,
ABWR(103,1)=     1.46,     1.14,    0.936,    0.791,    0.684,    0.602,
ABWR(109,1)=    0.536,    0.471,    0.418,    0.374,    0.338,    0.308,
ABWR(115,1)=    0.282,    0.259,    0.240,    0.223,    0.208,    0.120,
ABWR(121,1)=    0.081,    0.060,    0.047,    0.038,    0.032,    0.027,
ABWR(127,1)=    0.023,    0.020,    0.018,    0.016,    0.015,    0.013,
ABWR(133,1)=    0.012,    0.011,    0.011,
ABWR( 1,0)=  0.000001,      0.01,      0.02,      0.03,      0.04,      0.05,
ABWR( 7,0)=      0.06,      0.07,      0.08,      0.09,      0.10,      0.15,
ABWR(13,0)=      0.20,      0.25,      0.30,      0.35,      0.40,      0.45,
ABWR(19,0)=      0.50,      0.55,      0.60,      0.65,      0.70,      0.75,
ABWR(25,0)=      0.80,      0.85,      0.90,      0.95,      1.00,      1.50,
ABWR(31,0)=      2.00,      2.50,      3.00,      3.50,      4.00,      4.50,
ABWR(37,0)=      5.00,      5.50,      6.00,      6.50,      7.00,      7.50,
ABWR(43,0)=      8.00,      8.50,      9.00,      9.50,     10.00,     15.00,
ABWR(49,0)=     20.00,     25.00,     30.00,     35.00,     40.00,     45.00,
ABWR(55,0)=     50.00,     55.00,     60.00,     65.00,     70.00,     75.00,
ABWR(61,0)=     80.00,     85.00,     90.00,     95.00,    100.00,    150.00,
ABWR(67,0)=    200.00,    250.00,    300.00,    350.00,    400.00,    450.00,
ABWR(73,0)=    500.00,    550.00,    600.00,    650.00,    700.00,    750.00,
ABWR(79,0)=    800.00,    850.00,    900.00,    950.00,   1000.00,   1500.00,
ABWR(85,0)=   2000.00,   2500.00,   3000.00,   3500.00,   4000.00,   4500.00,
ABWR(91,0)=   5000.00,   5500.00,   6000.00,   6500.00,   7000.00,   7500.00,
ABWR(97,0)=   8000.00,   8500.00,   9000.00,   9500.00,  10000.00,  15000.00,
ABWR(103,0)=  20000.00,  25000.00,  30000.00,  35000.00,  40000.00,  45000.00,
ABWR(109,0)=  50000.00,  55000.00,  60000.00,  65000.00,  70000.00,  75000.00,
ABWR(115,0)=  80000.00,  85000.00,  90000.00,  95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ****************************************************************
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/COM, **                                                                **
/COM, **    Assembly Type:              PWR                             **
/COM, **    Decay Period (years):       900000                          **
/COM, **    Number of assemblies:       94616                           **
/COM, **    Ave Age:                    26.710                          **
/COM, **    Ave Burnup:                 38757.079                       **
/COM, **    Ave Enrichment:             3.648                           **
/COM, **    Ave MTU/assy:               0.431                           **
/COM, **
/COM, ***********************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   452.43,   452.32,   452.21,   452.10,   451.99,   451.88,
APWR( 7,1)=   451.77,   451.66,   451.55,   451.45,   451.33,   450.79,
APWR(13,1)=   450.24,   449.70,   449.16,   448.63,   448.09,   447.56,
APWR(19,1)=   447.03,   446.50,   445.98,   445.46,   444.93,   444.42,
APWR(25,1)=   443.90,   443.39,   442.87,   442.36,   441.86,   436.93,
APWR(31,1)=   432.20,   427.62,   423.20,   418.88,   414.71,   410.61,
APWR(37,1)=   406.65,   402.66,   398.80,   395.04,   391.39,   387.78,
APWR(43,1)=   384.26,   380.78,   377.40,   374.05,   370.79,   340.25,
APWR(49,1)=   313.52,   289.82,   268.84,   250.11,   233.35,   218.30,
APWR(55,1)=   204.84,   192.74,   181.86,   172.04,   163.16,   155.12,
APWR(61,1)=   147.89,   141.38,   135.43,   129.96,   125.00,    93.65,
APWR(67,1)=    77.86,    68.36,    61.67,    56.36,    52.05,    48.49,
APWR(73,1)=    45.26,    42.33,    39.81,    37.62,    35.56,    33.62,
APWR(79,1)=    31.89,    30.35,    28.96,    27.71,    26.50,    18.24,
APWR(85,1)=    14.38,    12.35,    11.25,    10.59,    10.06,     9.70,
APWR(91,1)=     9.38,     9.01,     8.68,     8.39,     8.13,     7.86,
APWR(97,1)=     7.61,     7.39,     7.18,     7.00,     6.82,     5.02,
APWR(103,1)=    4.04,     3.17,     2.59,     2.19,     1.89,     1.66,
APWR(109,1)=    1.48,     1.30,     1.15,     1.03,    0.926,    0.841,
APWR(115,1)=   0.768,    0.706,    0.652,    0.605,    0.563,    0.320,
APWR(121,1)=   0.214,    0.157,    0.122,    0.098,    0.082,    0.069,
APWR(127,1)=   0.060,    0.052,    0.047,    0.042,    0.038,    0.034,
APWR(133,1)=   0.031,    0.029,    0.026,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ***********************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case7.wsm                          **
/COM, **    Output File Name:       case7.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   125320                             **
/COM, **    Ave Age:                23.007                             **
/COM, **    Ave Burnup:             32843.787                          **
/COM, **    Ave Enrichment:         3.087                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   180.83,   180.79,   180.74,   180.70,   180.65,   180.61,
ABWR( 7,1)=   180.57,   180.52,   180.48,   180.43,   180.39,   180.17,
ABWR(13,1)=   179.95,   179.74,   179.52,   179.31,   179.10,   178.88,
ABWR(19,1)=   178.67,   178.46,   178.25,   178.04,   177.84,   177.63,
ABWR(25,1)=   177.42,   177.22,   177.01,   176.81,   176.61,   174.63,
ABWR(31,1)=   172.74,   170.90,   169.12,   167.38,   165.70,   164.05,
ABWR(37,1)=   162.45,   160.86,   159.32,   157.81,   156.35,   154.89,
ABWR(43,1)=   153.48,   152.08,   150.71,   149.36,   148.04,   135.76,
ABWR(49,1)=   125.04,   115.56,   107.17,    99.70,    93.03,    87.06,
ABWR(55,1)=    81.72,    76.93,    72.62,    68.74,    65.24,    62.09,
ABWR(61,1)=    59.24,    56.67,    54.33,    52.17,    50.21,    37.77,
ABWR(67,1)=    31.41,    27.51,    24.76,    22.56,    20.78,    19.30,
ABWR(73,1)=    17.98,    16.77,    15.74,    14.84,    14.00,    13.20,
ABWR(79,1)=    12.49,    11.86,    11.29,    10.78,    10.29,     6.93,
ABWR(85,1)=     5.37,     4.56,     4.13,     3.87,     3.67,     3.54,
ABWR(91,1)=     3.42,     3.28,     3.16,     3.06,     2.96,     2.86,
ABWR(97,1)=     2.77,     2.69,     2.62,     2.55,     2.48,     1.83,
ABWR(103,1)=     1.47,     1.15,    0.946,    0.799,    0.691,    0.608,
ABWR(109,1)=    0.542,    0.476,    0.423,    0.379,    0.343,    0.312,
ABWR(115,1)=    0.286,    0.263,    0.244,    0.226,    0.211,    0.122,
ABWR(121,1)=    0.083,    0.061,    0.048,    0.039,    0.032,    0.028,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:              PWR                             **
/COM, **    Decay Period (years):       900000                          **
/COM, **    Number of assemblies:       94692                           **
/COM, **    Ave Age:                    23.553                          **
/COM, **    Ave Burnup:                 39844.154                       **
/COM, **    Ave Enrichment:             3.739                           **
/COM, **    Ave MTU/assy:               0.432                           **
/COM, **                                                                **
/COM, ************************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   477.44,   477.33,   477.21,   477.10,   476.99,   476.88,
APWR( 7,1)=   476.77,   476.65,   476.54,   476.43,   476.32,   475.76,
APWR(13,1)=   475.21,   474.66,   474.11,   473.56,   473.02,   472.48,
APWR(19,1)=   471.94,   471.40,   470.87,   470.33,   469.80,   469.27,
APWR(25,1)=   468.75,   468.22,   467.70,   467.18,   466.66,   461.59,
APWR(31,1)=   456.70,   451.93,   447.33,   442.81,   438.43,   434.12,
APWR(37,1)=   429.94,   425.76,   421.72,   417.75,   413.90,   410.07,
APWR(43,1)=   406.35,   402.64,   399.03,   395.46,   391.98,   359.40,
APWR(49,1)=   330.89,   305.61,   283.18,   263.16,   245.27,   229.23,
APWR(55,1)=   214.85,   201.93,   190.29,   179.80,   170.35,   161.84,
APWR(61,1)=   154.15,   147.19,   140.84,   135.03,   129.75,    96.53,
APWR(67,1)=    79.87,    69.90,    62.97,    57.47,    53.02,    49.36,
APWR(73,1)=    46.08,    43.08,    40.51,    38.27,    36.18,    34.20,
APWR(79,1)=    32.45,    30.88,    29.47,    28.19,    26.97,    18.59,
APWR(85,1)=    14.66,    12.61,    11.49,    10.81,    10.27,     9.90,
APWR(91,1)=     9.57,     9.19,     8.86,     8.56,     8.30,     8.02,
APWR(97,1)=     7.77,     7.54,     7.33,     7.13,     6.95,     5.11,
APWR(103,1)=    4.11,     3.22,     2.64,     2.23,     1.92,     1.69,
APWR(109,1)=    1.51,     1.32,     1.17,     1.05,    0.944,    0.857,
APWR(115,1)=   0.784,    0.721,    0.666,    0.618,    0.575,    0.328,
APWR(121,1)=   0.220,    0.162,    0.126,    0.102,    0.084,    0.072,
APWR(127,1)=   0.062,    0.054,    0.048,    0.043,    0.039,    0.035,
APWR(133,1)=   0.032,    0.030,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ************************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case8.wsm                          **
/COM, **    Output File Name:       case8.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   125343                             **
/COM, **    Ave Age:                23.001                             **
/COM, **    Ave Burnup:             32845.503                          **
/COM, **    Ave Enrichment:         3.087                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   180.85,   180.80,   180.76,   180.72,   180.67,   180.63,
ABWR( 7,1)=   180.58,   180.54,   180.50,   180.45,   180.41,   180.19,
ABWR(13,1)=   179.97,   179.76,   179.54,   179.33,   179.11,   178.90,
ABWR(19,1)=   178.69,   178.48,   178.27,   178.06,   177.85,   177.65,
ABWR(25,1)=   177.44,   177.24,   177.03,   176.83,   176.63,   174.65,
ABWR(31,1)=   172.76,   170.91,   169.14,   167.40,   165.72,   164.07,
ABWR(37,1)=   162.47,   160.88,   159.34,   157.83,   156.37,   154.91,
ABWR(43,1)=   153.49,   152.09,   150.73,   149.37,   148.05,   135.77,
ABWR(49,1)=   125.05,   115.58,   107.18,    99.70,    93.03,    87.07,
ABWR(55,1)=    81.73,    76.94,    72.63,    68.74,    65.24,    62.09,
ABWR(61,1)=    59.25,    56.68,    54.33,    52.17,    50.22,    37.77,
ABWR(67,1)=    31.42,    27.51,    24.76,    22.56,    20.78,    19.30,
ABWR(73,1)=    17.99,    16.78,    15.74,    14.84,    14.00,    13.20,
ABWR(79,1)=    12.49,    11.86,    11.29,    10.78,    10.29,     6.93,
ABWR(85,1)=     5.37,     4.56,     4.13,     3.87,     3.67,     3.54,
ABWR(91,1)=     3.42,     3.28,     3.16,     3.06,     2.96,     2.86,
ABWR(97,1)=     2.77,     2.69,     2.62,     2.55,     2.48,     1.83,
ABWR(103,1)=     1.47,     1.15,    0.946,    0.800,    0.691,    0.608,
ABWR(109,1)=    0.542,    0.476,    0.423,    0.379,    0.343,    0.312,
ABWR(115,1)=    0.286,    0.263,    0.244,    0.226,    0.211,    0.122,
ABWR(121,1)=    0.083,    0.061,    0.048,    0.039,    0.032,    0.028,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     94668                             **
/COM, **    Ave Age:                  23.556                            **
/COM, **    Ave Burnup:               39849.758                         **
/COM, **    Ave Enrichment:           3.739                             **
/COM, **    Ave MTU/assy:             0.432                             **
/COM, **                                                                **
/COM, ***********************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   477.48,   477.36,   477.25,   477.14,   477.03,   476.92,
APWR( 7,1)=   476.80,   476.69,   476.58,   476.47,   476.36,   475.80,
APWR(13,1)=   475.25,   474.70,   474.15,   473.60,   473.06,   472.51,
APWR(19,1)=   471.97,   471.44,   470.90,   470.37,   469.84,   469.31,
APWR(25,1)=   468.78,   468.26,   467.74,   467.21,   466.70,   461.62,
APWR(31,1)=   456.74,   451.97,   447.37,   442.84,   438.47,   434.15,
APWR(37,1)=   429.97,   425.80,   421.75,   417.79,   413.93,   410.10,
APWR(43,1)=   406.38,   402.67,   399.06,   395.49,   392.01,   359.43,
APWR(49,1)=   330.92,   305.63,   283.20,   263.18,   245.30,   229.25,
APWR(55,1)=   214.87,   201.95,   190.31,   179.82,   170.37,   161.85,
APWR(61,1)=   154.17,   147.20,   140.86,   135.04,   129.77,    96.54,
APWR(67,1)=    79.88,    69.91,    62.98,    57.47,    53.03,    49.36,
APWR(73,1)=    46.08,    43.08,    40.51,    38.27,    36.18,    34.21,
APWR(79,1)=    32.45,    30.88,    29.47,    28.20,    26.97,    18.59,
APWR(85,1)=    14.66,    12.61,    11.49,    10.82,    10.27,     9.90,
APWR(91,1)=     9.58,     9.20,     8.86,     8.57,     8.30,     8.02,
APWR(97,1)=     7.77,     7.54,     7.33,     7.13,     6.95,     5.11,
APWR(103,1)=     4.11,     3.22,     2.64,     2.23,     1.92,     1.69,
APWR(109,1)=     1.51,     1.32,     1.17,     1.05,    0.944,    0.858,
APWR(115,1)=    0.784,    0.721,    0.666,    0.618,    0.575,    0.328,
APWR(121,1)=    0.220,    0.162,    0.126,    0.102,    0.084,    0.072,
APWR(127,1)=    0.062,    0.054,    0.048,    0.043,    0.039,    0.035,
APWR(133,1)=    0.032,    0.030,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ***********************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case9.wsm                          **
/COM, **    Output File Name:       case9.dat                          **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   167752                             **
/COM, **    Ave Age:                26.265                             **
/COM, **    Ave Burnup:             32713.272                          **
/COM, **    Ave Enrichment:         3.093                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   183.06,   183.00,   182.94,   182.87,   182.81,   182.75,
ABWR( 7,1)=   182.69,   182.62,   182.56,   182.50,   182.43,   182.12,
ABWR(13,1)=   181.81,   181.51,   181.20,   180.90,   180.60,   180.30,
ABWR(19,1)=   180.00,   179.71,   179.41,   179.12,   178.83,   178.55,
ABWR(25,1)=   178.26,   177.98,   177.69,   177.41,   177.13,   174.56,
ABWR(31,1)=   172.13,   169.88,   167.75,   165.73,   163.81,   162.01,
ABWR(37,1)=   160.28,   158.50,   156.80,   155.18,   153.62,   152.09,
ABWR(43,1)=   150.62,   149.17,   147.77,   146.44,   145.15,   132.76,
ABWR(49,1)=   122.26,   112.90,   104.68,    97.38,    90.95,    85.05,
ABWR(55,1)=    79.86,    75.20,    71.02,    67.25,    63.84,    60.76,
ABWR(61,1)=    57.98,    55.46,    53.25,    51.12,    49.21,    37.08,
ABWR(67,1)=    30.90,    27.09,    24.40,    22.24,    20.49,    19.04,
ABWR(73,1)=    17.74,    16.55,    15.53,    14.65,    13.82,    13.03,
ABWR(79,1)=    12.34,    11.72,    11.16,    10.65,    10.17,     6.86,
ABWR(85,1)=     5.32,     4.52,     4.09,     3.84,     3.64,     3.51,
ABWR(91,1)=     3.39,     3.26,     3.14,     3.03,     2.94,     2.84,
ABWR(97,1)=     2.75,     2.67,     2.60,     2.53,     2.47,     1.82,
ABWR(103,1)=     1.46,     1.15,    0.940,    0.794,    0.687,    0.604,
ABWR(109,1)=    0.539,    0.473,    0.420,    0.377,    0.341,    0.310,
ABWR(115,1)=    0.284,    0.262,    0.242,    0.225,    0.210,    0.121,
ABWR(121,1)=    0.082,    0.061,    0.047,    0.039,    0.032,    0.027,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:          PWR                                 **
/COM, **    Decay Period (years):   900000                              **
/COM, **    Number of assemblies:   131523                              **
/COM, **    Ave Age:                25.271                              **
/COM, **    Ave Burnup:             39821.826                           **
/COM, **    Ave Enrichment:         3.750                               **
/COM, **    Ave MTU/assy:           0.434                               **
/COM, **                                                                **
/COM, ******************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   511.58,   511.39,   511.19,   511.00,   510.81,   510.61,
APWR( 7,1)=   510.42,   510.23,   510.04,   509.85,   509.66,   508.71,
APWR(13,1)=   507.76,   506.82,   505.89,   504.97,   504.05,   503.15,
APWR(19,1)=   502.24,   501.35,   500.46,   499.57,   498.70,   497.83,
APWR(25,1)=   496.96,   496.11,   495.25,   494.41,   493.57,   485.97,
APWR(31,1)=   478.83,   472.27,   466.05,   460.24,   454.70,   449.52,
APWR(37,1)=   444.54,   439.44,   434.53,   429.97,   425.57,   421.26,
APWR(43,1)=   417.10,   413.01,   409.06,   405.29,   401.64,   366.66,
APWR(49,1)=   337.07,   310.75,   287.57,   266.97,   248.75,   232.15,
APWR(55,1)=   217.43,   204.22,   192.36,   181.66,   172.00,   163.27,
APWR(61,1)=   155.38,   148.25,   141.93,   135.96,   130.59,    96.73,
APWR(67,1)=    79.95,    69.93,    62.98,    57.47,    53.02,    49.35,
APWR(73,1)=    46.07,    43.08,    40.51,    38.27,    36.18,    34.21,
APWR(79,1)=    32.46,    30.90,    29.49,    28.22,    26.99,    18.63,
APWR(85,1)=    14.72,    12.66,    11.54,    10.87,    10.32,     9.95,
APWR(91,1)=     9.62,     9.24,     8.90,     8.61,     8.34,     8.06,
APWR(97,1)=     7.80,     7.57,     7.36,     7.17,     6.98,     5.14,
APWR(103,1)=    4.13,     3.23,     2.65,     2.24,     1.93,     1.70,
APWR(109,1)=    1.51,     1.32,     1.17,     1.05,    0.948,    0.862,
APWR(115,1)=   0.788,    0.725,    0.669,    0.621,    0.579,    0.330,
APWR(121,1)=   0.222,    0.163,    0.127,    0.102,    0.085,    0.072,
APWR(127,1)=   0.063,    0.055,    0.049,    0.044,    0.039,    0.036,
APWR(133,1)=   0.033,    0.030,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case10.wsm                         **
/COM, **    Output File Name:       case10.dat                         **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   167745                             **
/COM, **    Ave Age:                25.495                             **
/COM, **    Ave Burnup:             32713.029                          **
/COM, **    Ave Enrichment:         3.093                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   183.74,   183.68,   183.62,   183.57,   183.51,   183.45,
ABWR( 7,1)=   183.40,   183.34,   183.28,   183.23,   183.17,   182.89,
ABWR(13,1)=   182.62,   182.34,   182.06,   181.79,   181.52,   181.25,
ABWR(19,1)=   180.98,   180.72,   180.45,   180.19,   179.92,   179.66,
ABWR(25,1)=   179.40,   179.15,   178.89,   178.63,   178.38,   176.01,
ABWR(31,1)=   173.75,   171.62,   169.58,   167.63,   165.76,   163.99,
ABWR(37,1)=   162.29,   160.52,   158.82,   157.23,   155.68,   154.16,
ABWR(43,1)=   152.69,   151.24,   149.84,   148.49,   147.18,   134.61,
ABWR(49,1)=   123.93,   114.39,   106.02,    98.58,    92.03,    86.02,
ABWR(55,1)=    80.74,    76.00,    71.73,    67.89,    64.42,    61.29,
ABWR(61,1)=    58.46,    55.90,    53.66,    51.48,    49.55,    37.24,
ABWR(67,1)=    30.99,    27.15,    24.45,    22.28,    20.52,    19.07,
ABWR(73,1)=    17.76,    16.57,    15.55,    14.66,    13.83,    13.04,
ABWR(79,1)=    12.35,    11.73,    11.17,    10.66,    10.18,     6.86,
ABWR(85,1)=     5.32,     4.52,     4.09,     3.84,     3.64,     3.51,
ABWR(91,1)=     3.39,     3.26,     3.14,     3.04,     2.94,     2.84,
ABWR(97,1)=     2.75,     2.67,     2.60,     2.53,     2.47,     1.82,
ABWR(103,1)=     1.46,     1.15,    0.940,    0.795,    0.687,    0.604,
ABWR(109,1)=    0.539,    0.473,    0.420,    0.377,    0.341,    0.310,
ABWR(115,1)=    0.284,    0.262,    0.242,    0.225,    0.210,    0.121,
ABWR(121,1)=    0.082,    0.061,    0.047,    0.039,    0.032,    0.027,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     131519                            **
/COM, **    Ave Age:                  25.387                            **
/COM, **    Ave Burnup:               39821.772                         **
/COM, **    Ave Enrichment:           3.750                             **
/COM, **    Ave MTU/assy:             0.434                             **
/COM, **
/COM, ***********************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   497.48,   497.32,   497.17,   497.02,   496.86,   496.71,
APWR( 7,1)=   496.56,   496.40,   496.25,   496.10,   495.95,   495.19,
APWR(13,1)=   494.43,   493.68,   492.94,   492.19,   491.46,   490.72,
APWR(19,1)=   489.99,   489.27,   488.55,   487.83,   487.12,   486.41,
APWR(25,1)=   485.70,   485.00,   484.30,   483.61,   482.92,   476.51,
APWR(31,1)=   470.40,   464.62,   459.10,   453.85,   448.81,   444.02,
APWR(37,1)=   439.40,   434.58,   429.93,   425.61,   421.44,   417.31,
APWR(43,1)=   413.31,   409.37,   405.55,   401.90,   398.35,   364.08,
APWR(49,1)=   334.93,   308.87,   285.95,   265.54,   247.50,   231.03,
APWR(55,1)=   216.45,   203.36,   191.57,   180.95,   171.37,   162.71,
APWR(61,1)=   154.88,   147.81,   141.54,   135.58,   130.26,    96.61,
APWR(67,1)=    79.89,    69.90,    62.95,    57.45,    53.00,    49.34,
APWR(73,1)=    46.05,    43.06,    40.50,    38.26,    36.17,    34.20,
APWR(79,1)=    32.46,    30.89,    29.49,    28.21,    26.99,    18.63,
APWR(85,1)=    14.71,    12.66,    11.54,    10.87,    10.32,     9.95,
APWR(91,1)=     9.62,     9.24,     8.90,     8.61,     8.34,     8.06,
APWR(97,1)=     7.80,     7.57,     7.36,     7.17,     6.98,     5.14,
APWR(103,1)=    4.13,     3.23,     2.65,     2.24,     1.93,     1.70,
APWR(109,1)=    1.51,     1.32,     1.17,     1.05,    0.948,    0.862,
APWR(115,1)=   0.788,    0.725,    0.669,    0.621,    0.579,    0.330,
APWR(121,1)=   0.222,    0.163,    0.127,    0.102,    0.085,    0.072,
APWR(127,1)=   0.063,    0.055,    0.049,    0.044,    0.039,    0.036,
APWR(133,1)=   0.033,    0.030,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ***********************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case11.wsm                         **
/COM, **    Output File Name:       case11.dat                         **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   167752                             **
/COM, **    Ave Age:                26.147                             **
/COM, **    Ave Burnup:             32713.324                          **
/COM, **    Ave Enrichment:         3.093                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   183.00,   182.95,   182.89,   182.83,   182.78,   182.72,
ABWR( 7,1)=   182.66,   182.60,   182.55,   182.49,   182.43,   182.15,
ABWR(13,1)=   181.87,   181.60,   181.32,   181.04,   180.77,   180.50,
ABWR(19,1)=   180.23,   179.96,   179.70,   179.43,   179.17,   178.91,
ABWR(25,1)=   178.65,   178.39,   178.13,   177.88,   177.62,   175.22,
ABWR(31,1)=   172.94,   170.81,   168.78,   166.84,   164.98,   163.20,
ABWR(37,1)=   161.49,   159.79,   158.15,   156.55,   155.01,   153.49,
ABWR(43,1)=   152.03,   150.58,   149.17,   147.80,   146.47,   134.09,
ABWR(49,1)=   123.39,   113.96,   105.64,    98.24,    91.65,    85.75,
ABWR(55,1)=    80.49,    75.77,    71.53,    67.70,    64.25,    61.13,
ABWR(61,1)=    58.32,    55.80,    53.51,    51.38,    49.46,    37.19,
ABWR(67,1)=    30.97,    27.13,    24.43,    22.27,    20.51,    19.06,
ABWR(73,1)=    17.75,    16.56,    15.54,    14.66,    13.82,    13.04,
ABWR(79,1)=    12.34,    11.72,    11.16,    10.66,    10.17,     6.86,
ABWR(85,1)=     5.32,     4.52,     4.09,     3.84,     3.64,     3.51,
ABWR(91,1)=     3.39,     3.26,     3.14,     3.04,     2.94,     2.84,
ABWR(97,1)=     2.75,     2.67,     2.60,     2.53,     2.47,     1.82,
ABWR(103,1)=     1.46,     1.15,    0.940,    0.794,    0.687,    0.604,
ABWR(109,1)=    0.539,    0.473,    0.420,    0.377,    0.341,    0.310,
ABWR(115,1)=    0.284,    0.262,    0.242,    0.225,    0.210,    0.121,
ABWR(121,1)=    0.082,    0.061,    0.047,    0.039,    0.032,    0.027,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     131522                            **
/COM, **    Ave Age:                  25.297                            **
/COM, **    Ave Burnup:               39821.919                         **
/COM, **    Ave Enrichment:           3.750                             **
/COM, **    Ave MTU/assy:             0.434                             **
/COM, **                                                                **
/COM, ************************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   506.90,   506.73,   506.56,   506.38,   506.21,   506.04,
APWR( 7,1)=   505.87,   505.69,   505.52,   505.35,   505.18,   504.33,
APWR(13,1)=   503.48,   502.64,   501.81,   500.98,   500.16,   499.34,
APWR(19,1)=   498.53,   497.73,   496.93,   496.14,   495.35,   494.57,
APWR(25,1)=   493.79,   493.02,   492.25,   491.49,   490.74,   483.72,
APWR(31,1)=   477.09,   470.95,   465.10,   459.57,   454.28,   449.22,
APWR(37,1)=   444.36,   439.57,   434.96,   430.49,   426.17,   421.92,
APWR(43,1)=   417.81,   413.77,   409.85,   406.01,   402.29,   367.74,
APWR(49,1)=   337.96,   311.68,   288.45,   267.79,   249.35,   232.83,
APWR(55,1)=   218.06,   204.80,   192.87,   182.11,   172.40,   163.63,
APWR(61,1)=   155.73,   148.62,   142.16,   136.23,   130.85,    96.85,
APWR(67,1)=    80.03,    69.98,    63.01,    57.49,    53.04,    49.37,
APWR(73,1)=    46.08,    43.09,    40.52,    38.28,    36.19,    34.22,
APWR(79,1)=    32.47,    30.90,    29.50,    28.22,    27.00,    18.63,
APWR(85,1)=    14.72,    12.66,    11.54,    10.87,    10.32,     9.95,
APWR(91,1)=     9.62,     9.24,     8.90,     8.61,     8.34,     8.06,
APWR(97,1)=     7.80,     7.57,     7.36,     7.17,     6.98,     5.14,
APWR(103,1)=     4.13,     3.23,     2.65,     2.24,     1.93,     1.70,
APWR(109,1)=     1.51,     1.32,     1.17,     1.05,    0.948,    0.862,
APWR(115,1)=    0.788,    0.725,    0.669,    0.621,    0.579,    0.330,
APWR(121,1)=    0.222,    0.163,    0.127,    0.102,    0.085,    0.072,
APWR(127,1)=    0.063,    0.055,    0.049,    0.044,    0.039,    0.036,
APWR(133,1)=    0.033,    0.030,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ************************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case12.wsm                         **
/COM, **    Output File Name:       case12.dat                         **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   167745                             **
/COM, **    Ave Age:                25.586                             **
/COM, **    Ave Burnup:             32712.977                          **
/COM, **    Ave Enrichment:         3.093                              **
/COM, **    Ave MTU/assy:           0.177                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,ABWR,
*DIM,ABWR,TABLE,135,1,
ABWR( 1,1)=   173.38,   173.34,   173.30,   173.26,   173.22,   173.18,
ABWR( 7,1)=   173.13,   173.09,   173.05,   173.01,   172.97,   172.76,
ABWR(13,1)=   172.56,   172.35,   172.15,   171.95,   171.75,   171.54,
ABWR(19,1)=   171.34,   171.15,   170.95,   170.75,   170.55,   170.36,
ABWR(25,1)=   170.16,   169.97,   169.77,   169.58,   169.39,   167.52,
ABWR(31,1)=   165.73,   163.98,   162.30,   160.65,   159.05,   157.48,
ABWR(37,1)=   155.97,   154.46,   153.00,   151.56,   150.17,   148.79,
ABWR(43,1)=   147.45,   146.12,   144.82,   143.53,   142.27,   130.59,
ABWR(49,1)=   120.39,   111.36,   103.36,    96.24,    89.88,    84.19,
ABWR(55,1)=    79.11,    74.54,    70.42,    66.71,    63.37,    60.35,
ABWR(61,1)=    57.63,    55.17,    52.93,    50.86,    48.99,    37.03,
ABWR(67,1)=    30.88,    27.08,    24.40,    22.24,    20.49,    19.05,
ABWR(73,1)=    17.74,    16.56,    15.54,    14.65,    13.82,    13.04,
ABWR(79,1)=    12.34,    11.72,    11.16,    10.66,    10.17,     6.86,
ABWR(85,1)=     5.32,     4.52,     4.09,     3.84,     3.64,     3.51,
ABWR(91,1)=     3.39,     3.26,     3.14,     3.03,     2.94,     2.84,
ABWR(97,1)=     2.75,     2.67,     2.60,     2.53,     2.47,     1.82,
ABWR(103,1)=     1.46,     1.15,    0.940,    0.794,    0.687,    0.604,
ABWR(109,1)=    0.539,    0.473,    0.420,    0.377,    0.341,    0.310,
ABWR(115,1)=    0.284,    0.262,    0.242,    0.225,    0.210,    0.121,
ABWR(121,1)=    0.082,    0.061,    0.047,    0.039,    0.032,    0.027,
ABWR(127,1)=    0.024,    0.021,    0.019,    0.017,    0.015,    0.014,
ABWR(133,1)=    0.013,    0.012,    0.011,
ABWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
ABWR( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
ABWR(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
ABWR(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
ABWR(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
ABWR(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
ABWR(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
ABWR(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
ABWR(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
ABWR(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
ABWR(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
ABWR(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
ABWR(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
ABWR(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
ABWR(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
ABWR(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
ABWR(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
ABWR(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
ABWR(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
ABWR(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
ABWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
ABWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
ABWR(133,0)= 800000.00, 850000.00, 900000.00,
ABWR( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     131519                            **
/COM, **    Ave Age:                  25.390                            **
/COM, **    Ave Burnup:               39821.344                         **
/COM, **    Ave Enrichment:           3.750                             **
/COM, **    Ave MTU/assy:             0.434                             **
/COM, **                                                                **
/COM, ***********************************************************************
*SET,APWR,
*DIM,APWR,TABLE,135,1,
APWR( 1,1)=   472.71,   472.60,   472.48,   472.37,   472.25,   472.14,
APWR( 7,1)=   472.02,   471.91,   471.80,   471.68,   471.57,   471.00,
APWR(13,1)=   470.44,   469.88,   469.32,   468.76,   468.21,   467.66,
APWR(19,1)=   467.11,   466.56,   466.02,   465.48,   464.94,   464.40,
APWR(25,1)=   463.86,   463.33,   462.80,   462.27,   461.75,   456.62,
APWR(31,1)=   451.70,   446.92,   442.30,   437.79,   433.43,   429.14,
APWR(37,1)=   424.99,   420.86,   416.85,   412.92,   409.10,   405.31,
APWR(43,1)=   401.63,   397.96,   394.38,   390.85,   387.41,   355.27,
APWR(49,1)=   327.16,   302.25,   280.15,   260.44,   242.82,   227.02,
APWR(55,1)=   212.87,   200.15,   188.69,   178.36,   169.05,   160.65,
APWR(61,1)=   153.07,   146.21,   139.96,   134.23,   129.03,    96.20,
APWR(67,1)=    79.69,    69.79,    62.87,    57.39,    52.96,    49.31,
APWR(73,1)=    46.03,    43.04,    40.48,    38.25,    36.16,    34.19,
APWR(79,1)=    32.44,    30.88,    29.48,    28.21,    26.98,    18.63,
APWR(85,1)=    14.71,    12.66,    11.54,    10.87,    10.32,     9.95,
APWR(91,1)=     9.62,     9.24,     8.90,     8.61,     8.34,     8.06,
APWR(97,1)=     7.80,     7.57,     7.36,     7.17,     6.98,     5.14,
APWR(103,1)=    4.13,     3.23,     2.65,     2.24,     1.93,     1.70,
APWR(109,1)=    1.51,     1.32,     1.17,     1.05,    0.948,    0.862,
APWR(115,1)=   0.788,    0.725,    0.669,    0.621,    0.579,    0.330,
APWR(121,1)=   0.222,    0.163,    0.127,    0.102,    0.085,    0.072,
APWR(127,1)=   0.063,    0.055,    0.049,    0.044,    0.039,    0.036,
APWR(133,1)=   0.033,    0.030,    0.028,
APWR( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
APWR( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
APWR(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
APWR(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
APWR(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
APWR(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
APWR(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
APWR(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
APWR(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
APWR(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
APWR(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
APWR(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
APWR(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
APWR(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
APWR(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
APWR(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
APWR(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
APWR(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
APWR(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
APWR(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
APWR(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
APWR(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
APWR(133,0)= 800000.00, 850000.00, 900000.00,
APWR( 0,1)=1.0
/COM, ***********************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case1.wsm                          **
/COM, **    Output File Name:       finalw1.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   30317                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                27.920                             **
/COM, **    Ave Burnup:             44101.833                          **
/COM, **    Ave Enrichment:         3.723                              **
/COM, **    Ave MTU/assy:           0.428                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   489.13,   489.02,   488.91,   488.79,   488.68,   488.57,
BIN1( 7,1)=   488.46,   488.35,   488.24,   488.13,   488.02,   487.47,
BIN1(13,1)=   486.92,   486.37,   485.82,   485.28,   484.74,   484.20,
BIN1(19,1)=   483.67,   483.13,   482.60,   482.07,   481.54,   481.02,
BIN1(25,1)=   480.49,   479.97,   479.45,   478.93,   478.42,   473.40,
BIN1(31,1)=   468.57,   463.84,   459.27,   454.81,   450.48,   446.22,
BIN1(37,1)=   442.08,   437.90,   433.83,   429.90,   426.07,   422.25,
BIN1(43,1)=   418.53,   414.84,   411.25,   407.70,   404.24,   371.65,
BIN1(49,1)=   343.09,   317.69,   295.20,   275.10,   257.14,   240.98,
BIN1(55,1)=   226.51,   213.50,   201.78,   191.24,   181.78,   173.09,
BIN1(61,1)=   165.26,   158.17,   151.72,   145.78,   140.39,   105.93,
BIN1(67,1)=    88.03,    77.14,    69.39,    63.26,    58.32,    54.26,
BIN1(73,1)=    50.59,    47.30,    44.46,    42.00,    39.68,    37.51,
BIN1(79,1)=    35.59,    33.87,    32.32,    30.92,    29.57,    20.38,
BIN1(85,1)=    16.07,    13.80,    12.57,    11.83,    11.22,    10.82,
BIN1(91,1)=    10.46,    10.04,     9.67,     9.34,     9.04,     8.73,
BIN1(97,1)=     8.46,     8.20,     7.97,     7.76,     7.55,     5.53,
BIN1(103,1)=    4.43,     3.47,     2.83,     2.39,     2.06,     1.81,
BIN1(109,1)=    1.61,     1.41,     1.25,     1.12,     1.01,    0.923,
BIN1(115,1)=   0.845,    0.778,    0.719,    0.668,    0.622,    0.357,
BIN1(121,1)=   0.241,    0.177,    0.138,    0.112,    0.093,    0.079,
BIN1(127,1)=   0.069,    0.060,    0.053,    0.048,    0.043,    0.039,
BIN1(133,1)=   0.036,    0.033,    0.031,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:            PWR                             **
/COM, **    Decay Period (years):     900000                          **
/COM, **    Number of assemblies:     55455                           **
/COM, **    Assemblies/pkg:           21                              **
/COM, **    Max Heat (Watts/assy):    850.00                          **
/COM, **    Min Heat (Watts/assy):    0.00                            **
/COM, **    Max Kinf:                 1.130                           **
/COM, **    Min Kinf:                 1.000                           **
/COM, **    Ave Age:                  26.340                          **
/COM, **    Ave Burnup:               36662.111                       **
/COM, **    Ave Enrichment:           3.638                           **
/COM, **    Ave MTU/assy:             0.431                           **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   434.28,   434.15,   434.01,   433.88,   433.75,   433.61,
BIN2( 7,1)=   433.48,   433.35,   433.22,   433.08,   432.95,   432.29,
BIN2(13,1)=   431.63,   430.98,   430.33,   429.68,   429.04,   428.40,
BIN2(19,1)=   427.77,   427.14,   426.51,   425.88,   425.26,   424.65,
BIN2(25,1)=   424.03,   423.42,   422.81,   422.21,   421.61,   416.10,
BIN2(31,1)=   410.86,   405.90,   401.15,   396.67,   392.36,   388.29,
BIN2(37,1)=   384.36,   380.19,   376.17,   372.48,   368.91,   365.38,
BIN2(43,1)=   361.97,   358.62,   355.36,   352.27,   349.27,   319.85,
BIN2(49,1)=   294.93,   272.45,   252.66,   235.01,   219.41,   205.05,
BIN2(55,1)=   192.36,   180.95,   170.67,   161.41,   153.07,   145.49,
BIN2(61,1)=   138.64,   132.44,   126.98,   121.74,   117.08,    87.72,
BIN2(67,1)=    73.12,    64.39,    58.25,    53.34,    49.33,    46.00,
BIN2(73,1)=    42.97,    40.20,    37.82,    35.75,    33.79,    31.93,
BIN2(79,1)=    30.29,    28.82,    27.50,    26.30,    25.15,    17.27,
BIN2(85,1)=    13.58,    11.65,    10.61,     9.99,     9.49,     9.15,
BIN2(91,1)=     8.85,     8.51,     8.20,     7.93,     7.69,     7.43,
BIN2(97,1)=     7.20,     6.99,     6.80,     6.62,     6.46,     4.78,
BIN2(103,1)=     3.85,     3.02,     2.48,     2.09,     1.81,     1.59,
BIN2(109,1)=     1.42,     1.24,     1.10,    0.980,    0.883,    0.801,
BIN2(115,1)=    0.732,    0.672,    0.620,    0.574,    0.534,    0.302,
BIN2(121,1)=    0.201,    0.147,    0.114,    0.092,    0.076,    0.064,
BIN2(127,1)=    0.055,    0.049,    0.043,    0.038,    0.035,    0.031,
BIN2(133,1)=    0.029,    0.026,    0.024,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     2520                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  35.694                            **
/COM, **    Ave Burnup:               17417.637                         **
/COM, **    Ave Enrichment:           3.462                             **
/COM, **    Ave MTU/assy:             0.388                             **
/COM, **
/COM, ***********************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   138.32,   138.29,   138.26,   138.23,   138.20,   138.16,
BIN3( 7,1)=   138.13,   138.10,   138.07,   138.04,   138.01,   137.85,
BIN3(13,1)=   137.69,   137.54,   137.38,   137.23,   137.08,   136.92,
BIN3(19,1)=   136.77,   136.62,   136.47,   136.32,   136.17,   136.02,
BIN3(25,1)=   135.87,   135.73,   135.58,   135.43,   135.29,   133.86,
BIN3(31,1)=   132.49,   131.16,   129.88,   128.64,   127.43,   126.21,
BIN3(37,1)=   125.04,   123.87,   122.75,   121.63,   120.54,   119.47,
BIN3(43,1)=   118.42,   117.39,   116.39,   115.37,   114.37,   105.15,
BIN3(49,1)=    97.02,    89.76,    83.27,    77.48,    72.29,    67.63,
BIN3(55,1)=    63.47,    59.73,    56.38,    53.36,    50.63,    48.19,
BIN3(61,1)=    46.00,    44.01,    42.24,    40.62,    39.17,    30.27,
BIN3(67,1)=    26.03,    23.60,    21.81,    20.37,    19.12,    18.04,
BIN3(73,1)=    17.00,    16.05,    15.22,    14.49,    13.77,    13.10,
BIN3(79,1)=    12.51,    11.97,    11.48,    11.04,    10.61,     7.67,
BIN3(85,1)=     6.29,     5.55,     5.15,     4.90,     4.69,     4.55,
BIN3(91,1)=     4.42,     4.27,     4.14,     4.02,     3.91,     3.80,
BIN3(97,1)=     3.69,     3.60,     3.51,     3.43,     3.36,     2.58,
BIN3(103,1)=     2.14,     1.70,     1.41,     1.20,     1.05,    0.931,
BIN3(109,1)=    0.836,    0.725,    0.637,    0.565,    0.506,    0.457,
BIN3(115,1)=    0.415,    0.379,    0.348,    0.322,    0.298,    0.163,
BIN3(121,1)=    0.106,    0.076,    0.058,    0.046,    0.038,    0.032,
BIN3(127,1)=    0.027,    0.024,    0.021,    0.019,    0.017,    0.015,
BIN3(133,1)=    0.014,    0.012,    0.011,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     4674                              **
/COM, **    Assemblies/pkg:           12                                **
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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                10.369                           **
/COM, **    Ave Burnup:             52965.737                        **
/COM, **    Ave Enrichment:         4.247                            **
/COM, **    Ave MTU/assy:           0.453                            **
/COM, **
/COM, ******************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   935.91,   935.50,   935.08,   934.67,   934.26,   933.85,
BIN4( 7,1)=   933.44,   933.03,   932.63,   932.22,   931.81,   929.78,
BIN4(13,1)=   927.77,   925.77,   923.79,   921.81,   919.86,   917.91,
BIN4(19,1)=   915.98,   914.06,   912.16,   910.26,   908.38,   906.52,
BIN4(25,1)=   904.66,   902.82,   900.99,   899.17,   897.36,   881.27,
BIN4(31,1)=   866.12,   852.16,   838.95,   826.77,   815.19,   804.67,
BIN4(37,1)=   794.62,   783.24,   772.36,   763.10,   754.22,   745.49,
BIN4(43,1)=   737.09,   728.94,   721.09,   714.10,   707.34,   637.55,
BIN4(49,1)=   580.88,   530.05,   486.31,   447.57,   414.19,   382.89,
BIN4(55,1)=   355.88,   331.71,   310.06,   290.64,   273.18,   257.45,
BIN4(61,1)=   243.26,   230.46,   219.63,   208.67,   199.14,   139.54,
BIN4(67,1)=   111.31,    94.75,    84.02,    75.71,    69.19,    64.02,
BIN4(73,1)=    59.64,    55.63,    52.21,    49.24,    46.59,    44.09,
BIN4(79,1)=    41.86,    39.88,    38.09,    36.47,    34.96,    24.45,
BIN4(85,1)=    19.53,    16.90,    15.45,    14.54,    13.81,    13.30,
BIN4(91,1)=    12.86,    12.32,    11.85,    11.43,    11.06,    10.67,
BIN4(97,1)=    10.32,    10.00,     9.71,     9.44,     9.19,     6.65,
BIN4(103,1)=    5.29,     4.12,     3.36,     2.82,     2.43,     2.13,
BIN4(109,1)=    1.89,     1.67,     1.49,     1.34,     1.22,     1.11,
BIN4(115,1)=    1.02,    0.942,    0.874,    0.814,    0.761,    0.447,
BIN4(121,1)=   0.306,    0.228,    0.180,    0.147,    0.123,    0.106,
BIN4(127,1)=   0.092,    0.081,    0.072,    0.065,    0.059,    0.054,
BIN4(133,1)=   0.050,    0.046,    0.043,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                             **
/COM, **    Assembly Type:          STx                              **
/COM, **    Decay Period (years):   900000                           **
/COM, **    Number of assemblies:   1800                             **
/COM, **    Assemblies/pkg:         12                               **
/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  0.00                             **
/COM, **    Max Kinf:               1.130                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                15.944
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/COM, **    Ave Burnup:            44782.169                          **
/COM, **    Ave Enrichment:        3.887                              **
/COM, **    Ave MTU/assy:          0.539                              **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   873.09,   872.79,   872.49,   872.19,   871.89,   871.59,
BIN5( 7,1)=   871.29,   870.99,   870.69,   870.39,   870.09,   868.61,
BIN5(13,1)=   867.14,   865.67,   864.22,   862.77,   861.34,   859.91,
BIN5(19,1)=   858.49,   857.08,   855.67,   854.28,   852.89,   851.51,
BIN5(25,1)=   850.14,   848.78,   847.42,   846.08,   844.74,   832.25,
BIN5(31,1)=   820.42,   809.40,   798.90,   788.88,   779.31,   770.38,
BIN5(37,1)=   761.82,   752.77,   744.08,   736.05,   728.31,   720.77,
BIN5(43,1)=   713.49,   706.26,   699.28,   692.78,   686.49,   624.22,
BIN5(49,1)=   572.08,   525.37,   484.76,   448.62,   417.16,   387.96,
BIN5(55,1)=   362.48,   339.65,   319.14,   300.69,   284.12,   269.11,
BIN5(61,1)=   255.59,   243.29,   232.77,   222.25,   213.02,   154.41,
BIN5(67,1)=   125.26,   107.58,    95.72,    86.31,    78.91,    72.95,
BIN5(73,1)=    67.81,    63.13,    59.12,    55.66,    52.51,    49.52,
BIN5(79,1)=    46.88,    44.52,    42.40,    40.49,    38.69,    26.24,
BIN5(85,1)=    20.45,    17.43,    15.79,    14.83,    14.04,    13.52,
BIN5(91,1)=    13.07,    12.53,    12.06,    11.64,    11.26,    10.88,
BIN5(97,1)=    10.53,    10.21,     9.92,     9.65,     9.40,     6.85,
BIN5(103,1)=    5.47,     4.29,     3.51,     2.96,     2.56,     2.25,
BIN5(109,1)=    2.00,     1.77,     1.59,     1.43,     1.30,     1.19,
BIN5(115,1)=    1.10,     1.02,    0.946,    0.883,    0.827,    0.493,
BIN5(121,1)=   0.342,    0.257,    0.204,    0.168,    0.141,    0.122,
BIN5(127,1)=   0.106,    0.094,    0.084,    0.076,    0.069,    0.064,
BIN5(133,1)=   0.059,    0.054,    0.050,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:         BWR                                **
/COM, **    Decay Period (years):  900000                             **
/COM, **    Number of assemblies:  30587                              **
/COM, **    Assemblies/pkg:        44                                 **
/COM, **    Max Heat (Watts/assy): 400.00                             **
/COM, **    Min Heat (Watts/assy): 0.00                               **
/COM, **    Max Kinf:              1.000                              **
/COM, **    Min Kinf:              0.000                              **
/COM, **    Ave Age:               18.753                             **
/COM, **    Ave Burnup:            42164.201                          **
/COM, **    Ave Enrichment:        3.319                              **
/COM, **    Ave MTU/assy:          0.174                              **
/COM, **                                                              **
/COM, ******************************************************************
```

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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   264.20,   264.11,   264.02,   263.93,   263.85,   263.76,
BIN6( 7,1)=   263.67,   263.58,   263.49,   263.40,   263.31,   262.87,
BIN6(13,1)=   262.43,   261.99,   261.55,   261.12,   260.69,   260.26,
BIN6(19,1)=   259.84,   259.42,   259.00,   258.58,   258.16,   257.75,
BIN6(25,1)=   257.34,   256.93,   256.53,   256.12,   255.72,   252.01,
BIN6(31,1)=   248.49,   245.18,   242.04,   239.06,   236.21,   233.53,
BIN6(37,1)=   230.96,   228.25,   225.64,   223.22,   220.89,   218.59,
BIN6(43,1)=   216.37,   214.22,   212.14,   210.16,   208.25,   189.56,
BIN6(49,1)=   173.87,   159.83,   147.65,   136.84,   127.40,   118.67,
BIN6(55,1)=   111.06,   104.24,    98.12,    92.63,    87.71,    83.22,
BIN6(61,1)=    79.19,    75.54,    72.39,    69.25,    66.50,    48.97,
BIN6(67,1)=    40.12,    34.68,    30.95,    27.99,    25.64,    23.73,
BIN6(73,1)=    22.06,    20.54,    19.24,    18.12,    17.08,    16.11,
BIN6(79,1)=    15.24,    14.47,    13.78,    13.15,    12.56,     8.47,
BIN6(85,1)=     6.57,     5.59,     5.05,     4.74,     4.49,     4.32,
BIN6(91,1)=     4.17,     4.00,     3.85,     3.72,     3.60,     3.47,
BIN6(97,1)=     3.36,     3.26,     3.17,     3.08,     3.00,     2.19,
BIN6(103,1)=     1.75,     1.37,     1.12,    0.942,    0.813,    0.714,
BIN6(109,1)=    0.635,    0.561,    0.501,    0.451,    0.410,    0.375,
BIN6(115,1)=    0.345,    0.318,    0.296,    0.275,    0.258,    0.152,
BIN6(121,1)=    0.105,    0.078,    0.062,    0.051,    0.043,    0.037,
BIN6(127,1)=    0.032,    0.028,    0.025,    0.023,    0.021,    0.019,
BIN6(133,1)=    0.017,    0.016,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   92689                             **
/COM, **    Assemblies/pkg:         44                                **
/COM, **    Max Heat (Watts/assy):  400.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.370                             **
/COM, **    Min Kinf:               1.000                             **
/COM, **    Ave Age:                29.878                            **
/COM, **    Ave Burnup:             29420.945                         **
/COM, **    Ave Enrichment:         2.910                             **
/COM, **    Ave MTU/assy:           0.179                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   146.37,   146.33,   146.29,   146.25,   146.21,   146.17,
BIN7( 7,1)=   146.13,   146.10,   146.06,   146.02,   145.98,   145.79,
BIN7(13,1)=   145.60,   145.41,   145.22,   145.03,   144.85,   144.66,
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BIN7(19,1)=  144.48,   144.29,   144.11,   143.93,   143.75,   143.57,
BIN7(25,1)=  143.39,   143.21,   143.03,   142.85,   142.68,   141.03,
BIN7(31,1)=  139.45,   137.94,   136.50,   135.11,   133.77,   132.49,
BIN7(37,1)=  131.26,   129.97,   128.73,   127.54,   126.40,   125.26,
BIN7(43,1)=  124.15,   123.07,   122.02,   121.01,   120.02,   110.50,
BIN7(49,1)=  102.28,    94.90,    88.39,    82.58,    77.42,    72.69,
BIN7(55,1)=   68.51,    64.74,    61.36,    58.30,    55.55,    53.03,
BIN7(61,1)=   50.76,    48.70,    46.88,    45.13,    43.56,    33.55,
BIN7(67,1)=   28.33,    25.09,    22.72,    20.81,    19.24,    17.92,
BIN7(73,1)=   16.71,    15.60,    14.66,    13.83,    13.04,    12.30,
BIN7(79,1)=   11.64,    11.05,    10.53,    10.05,     9.58,     6.44,
BIN7(85,1)=    4.97,     4.22,     3.82,     3.58,     3.40,     3.27,
BIN7(91,1)=    3.16,     3.04,     2.93,     2.84,     2.75,     2.66,
BIN7(97,1)=    2.58,     2.50,     2.43,     2.37,     2.31,     1.71,
BIN7(103,1)=    1.38,     1.08,    0.888,    0.751,    0.650,    0.572,
BIN7(109,1)=   0.510,    0.446,    0.395,    0.354,    0.319,    0.290,
BIN7(115,1)=   0.265,    0.243,    0.225,    0.209,    0.194,    0.111,
BIN7(121,1)=   0.074,    0.054,    0.042,    0.034,    0.028,    0.024,
BIN7(127,1)=   0.021,    0.018,    0.016,    0.015,    0.013,    0.012,
BIN7(133,1)=   0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:            BWR                             **
/COM, **    Decay Period (years):     900000                          **
/COM, **    Number of assemblies:     993                             **
/COM, **    Assemblies/pkg:           24                              **
/COM, **    Max Heat (Watts/assy):    520.00                          **
/COM, **    Min Heat (Watts/assy):    0.00                            **
/COM, **    Max Kinf:                 1.540                           **
/COM, **    Min Kinf:                 0.000                           **
/COM, **    Ave Age:                  18.139                          **
/COM, **    Ave Burnup:               8835.600                        **
/COM, **    Ave Enrichment:           3.468                           **
/COM, **    Ave MTU/assy:             0.165                           **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    38.88,    38.87,    38.86,    38.85,    38.84,    38.83,
BIN8( 7,1)=    38.82,    38.81,    38.80,    38.79,    38.78,    38.72,
BIN8(13,1)=    38.67,    38.62,    38.56,    38.51,    38.46,    38.41,
BIN8(19,1)=    38.35,    38.30,    38.25,    38.20,    38.15,    38.10,
BIN8(25,1)=    38.05,    38.00,    37.95,    37.90,    37.85,    37.37,
BIN8(31,1)=    36.91,    36.46,    36.04,    35.62,    35.22,    34.81,
BIN8(37,1)=    34.42,    34.03,    33.66,    33.29,    32.95,    32.60,
BIN8(43,1)=    32.27,    31.94,    31.62,    31.29,    30.97,    28.07,
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BIN8(49,1)=    25.54,    23.31,    21.36,    19.62,    18.08,    16.71,
BIN8(55,1)=    15.49,    14.40,    13.43,    12.57,    11.80,    11.11,
BIN8(61,1)=    10.50,     9.96,     9.47,     9.02,     8.63,     6.36,
BIN8(67,1)=     5.40,     4.90,     4.56,     4.29,     4.06,     3.85,
BIN8(73,1)=     3.66,     3.47,     3.31,     3.17,     3.04,     2.92,
BIN8(79,1)=     2.80,     2.70,     2.60,     2.52,     2.44,     1.88,
BIN8(85,1)=     1.62,     1.48,     1.40,     1.35,     1.30,     1.26,
BIN8(91,1)=     1.23,     1.20,     1.16,     1.13,     1.11,     1.08,
BIN8(97,1)=     1.05,     1.03,     1.01,    0.986,    0.966,    0.762,
BIN8(103,1)=    0.644,    0.518,    0.434,    0.373,    0.328,    0.292,
BIN8(109,1)=    0.264,    0.229,    0.201,    0.178,    0.160,    0.144,
BIN8(115,1)=    0.131,    0.119,    0.110,    0.101,    0.094,    0.051,
BIN8(121,1)=    0.033,    0.024,    0.018,    0.014,    0.012,    0.010,
BIN8(127,1)=    0.008,    0.007,    0.006,    0.006,    0.005,    0.005,
BIN8(133,1)=    0.004,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case2.wsm                          **
/COM, **    Output File Name:       finalw2.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   30329                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                27.230                             **
/COM, **    Ave Burnup:             44075.419                          **
/COM, **    Ave Enrichment:         3.709                              **
/COM, **    Ave MTU/assy:           0.428                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   497.57,   497.45,   497.33,   497.21,   497.10,   496.98,
BIN1( 7,1)=   496.86,   496.74,   496.62,   496.51,   496.39,   495.80,
BIN1(13,1)=   495.22,   494.64,   494.06,   493.49,   492.91,   492.34,
BIN1(19,1)=   491.77,   491.21,   490.64,   490.08,   489.52,   488.97,
BIN1(25,1)=   488.41,   487.86,   487.31,   486.76,   486.21,   480.94,
BIN1(31,1)=   475.86,   470.93,   466.16,   461.51,   457.01,   452.62,
BIN1(37,1)=   448.36,   444.04,   439.85,   435.81,   431.88,   427.96,
BIN1(43,1)=   424.15,   420.37,   416.68,   413.06,   409.52,   376.21,
BIN1(49,1)=   347.15,   321.29,   298.41,   277.99,   259.76,   243.33,
BIN1(55,1)=   228.65,   215.44,   203.55,   192.85,   183.26,   174.45,
BIN1(61,1)=   166.51,   159.32,   152.80,   146.78,   141.32,   106.46,
BIN1(67,1)=    88.40,    77.44,    69.65,    63.48,    58.52,    54.44,
BIN1(73,1)=    50.76,    47.45,    44.60,    42.13,    39.80,    37.62,
BIN1(79,1)=    35.69,    33.97,    32.41,    31.01,    29.65,    20.42,
BIN1(85,1)=    16.10,    13.83,    12.59,    11.84,    11.24,    10.83,
BIN1(91,1)=    10.47,    10.05,     9.68,     9.35,     9.05,     8.75,
BIN1(97,1)=     8.47,     8.21,     7.98,     7.77,     7.57,     5.54,
BIN1(103,1)=     4.44,     3.47,     2.84,     2.39,     2.06,     1.81,
BIN1(109,1)=     1.61,     1.41,     1.25,     1.12,     1.02,    0.924,
BIN1(115,1)=    0.846,    0.778,    0.719,    0.668,    0.623,    0.357,
BIN1(121,1)=    0.241,    0.177,    0.138,    0.112,    0.093,    0.079,
BIN1(127,1)=    0.069,    0.060,    0.053,    0.048,    0.043,    0.039,
BIN1(133,1)=    0.036,    0.033,    0.031,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
```

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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     54876                             **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.130                             **
/COM, **    Min Kinf:                 1.000                             **
/COM, **    Ave Age:                  25.043                            **
/COM, **    Ave Burnup:               36993.288                         **
/COM, **    Ave Enrichment:           3.676                             **
/COM, **    Ave MTU/assy:             0.431                             **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   446.30,   446.16,   446.02,   445.88,   445.74,   445.60,
BIN2( 7,1)=   445.46,   445.32,   445.18,   445.04,   444.90,   444.20,
BIN2(13,1)=   443.51,   442.83,   442.14,   441.46,   440.79,   440.12,
BIN2(19,1)=   439.45,   438.79,   438.13,   437.47,   436.82,   436.17,
BIN2(25,1)=   435.52,   434.88,   434.24,   433.61,   432.98,   427.20,
BIN2(31,1)=   421.70,   416.53,   411.58,   406.89,   402.40,   398.16,
BIN2(37,1)=   394.08,   389.75,   385.57,   381.74,   378.03,   374.38,
BIN2(43,1)=   370.85,   367.38,   364.01,   360.83,   357.73,   327.32,
BIN2(49,1)=   301.65,   278.48,   258.09,   239.90,   223.88,   209.09,
BIN2(55,1)=   196.03,   184.29,   173.71,   164.19,   155.62,   147.82,
BIN2(61,1)=   140.78,   134.40,   128.81,   123.43,   118.64,    88.55,
BIN2(67,1)=    73.67,    64.80,    58.59,    53.64,    49.59,    46.23,
BIN2(73,1)=    43.19,    40.40,    38.00,    35.91,    33.95,    32.09,
BIN2(79,1)=    30.43,    28.96,    27.63,    26.42,    25.27,    17.35,
BIN2(85,1)=    13.64,    11.70,    10.66,    10.04,     9.53,     9.19,
BIN2(91,1)=     8.89,     8.54,     8.24,     7.97,     7.72,     7.47,
BIN2(97,1)=     7.23,     7.02,     6.83,     6.65,     6.48,     4.79,
BIN2(103,1)=     3.87,     3.03,     2.49,     2.10,     1.82,     1.60,
BIN2(109,1)=     1.43,     1.25,     1.10,    0.985,    0.887,    0.805,
BIN2(115,1)=    0.735,    0.675,    0.623,    0.577,    0.537,    0.304,
BIN2(121,1)=    0.203,    0.148,    0.115,    0.092,    0.077,    0.065,
BIN2(127,1)=    0.056,    0.049,    0.043,    0.039,    0.035,    0.032,
BIN2(133,1)=    0.029,    0.027,    0.025,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     3112                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  31.995                            **
/COM, **    Ave Burnup:               17873.954                         **
/COM, **    Ave Enrichment:           3.565                             **
/COM, **    Ave MTU/assy:             0.397                             **
/COM, **                                                                **
/COM, ***********************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   162.76,   162.72,   162.67,   162.62,   162.58,   162.53,
BIN3( 7,1)=   162.48,   162.44,   162.39,   162.34,   162.30,   162.07,
BIN3(13,1)=   161.84,   161.61,   161.38,   161.16,   160.93,   160.71,
BIN3(19,1)=   160.49,   160.26,   160.04,   159.83,   159.61,   159.39,
BIN3(25,1)=   159.18,   158.96,   158.75,   158.54,   158.33,   156.35,
BIN3(31,1)=   154.47,   152.68,   150.96,   149.32,   147.74,   146.21,
BIN3(37,1)=   144.74,   143.23,   141.78,   140.38,   139.03,   137.69,
BIN3(43,1)=   136.40,   135.13,   133.90,   132.67,   131.48,   120.28,
BIN3(49,1)=   110.61,   101.94,    94.25,    87.40,    81.31,    75.74,
BIN3(55,1)=    70.83,    66.41,    62.45,    58.91,    55.69,    52.82,
BIN3(61,1)=    50.24,    47.89,    45.85,    43.93,    42.23,    31.92,
BIN3(67,1)=    27.19,    24.55,    22.66,    21.13,    19.82,    18.70,
BIN3(73,1)=    17.63,    16.63,    15.77,    15.01,    14.27,    13.58,
BIN3(79,1)=    12.95,    12.40,    11.89,    11.43,    10.98,     7.93,
BIN3(85,1)=     6.50,     5.74,     5.32,     5.06,     4.85,     4.70,
BIN3(91,1)=     4.56,     4.41,     4.27,     4.15,     4.04,     3.92,
BIN3(97,1)=     3.82,     3.72,     3.63,     3.55,     3.47,     2.66,
BIN3(103,1)=     2.20,     1.75,     1.46,     1.24,     1.08,    0.961,
BIN3(109,1)=    0.863,    0.749,    0.659,    0.585,    0.524,    0.473,
BIN3(115,1)=    0.430,    0.393,    0.361,    0.334,    0.309,    0.170,
BIN3(121,1)=    0.111,    0.080,    0.061,    0.049,    0.040,    0.034,
BIN3(127,1)=    0.029,    0.025,    0.022,    0.019,    0.017,    0.016,
BIN3(133,1)=    0.014,    0.013,    0.012,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     4447                              **
/COM, **    Assemblies/pkg:           12                                **
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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                10.396                           **
/COM, **    Ave Burnup:             53357.122                        **
/COM, **    Ave Enrichment:         4.280                            **
/COM, **    Ave MTU/assy:           0.450                            **
/COM, **
/COM, ***********************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   937.77,   937.36,   936.95,   936.54,   936.13,   935.73,
BIN4( 7,1)=   935.32,   934.91,   934.51,   934.10,   933.70,   931.68,
BIN4(13,1)=   929.68,   927.69,   925.72,   923.76,   921.81,   919.87,
BIN4(19,1)=   917.95,   916.05,   914.15,   912.27,   910.40,   908.54,
BIN4(25,1)=   906.70,   904.86,   903.04,   901.23,   899.43,   883.37,
BIN4(31,1)=   868.24,   854.29,   841.08,   828.92,   817.37,   806.72,
BIN4(37,1)=   796.55,   785.22,   774.39,   765.12,   756.23,   747.47,
BIN4(43,1)=   739.04,   730.92,   723.11,   716.00,   709.13,   639.17,
BIN4(49,1)=   582.24,   531.27,   487.36,   448.47,   414.92,   383.56,
BIN4(55,1)=   356.46,   332.21,   310.48,   291.00,   273.48,   257.70,
BIN4(61,1)=   243.47,   230.63,   219.73,   208.76,   199.21,   139.41,
BIN4(67,1)=   111.09,    94.50,    83.75,    75.43,    68.92,    63.77,
BIN4(73,1)=    59.39,    55.41,    52.00,    49.04,    46.41,    43.92,
BIN4(79,1)=    41.71,    39.73,    37.95,    36.34,    34.85,    24.40,
BIN4(85,1)=    19.51,    16.89,    15.44,    14.54,    13.81,    13.30,
BIN4(91,1)=    12.85,    12.32,    11.85,    11.43,    11.06,    10.67,
BIN4(97,1)=    10.31,     9.99,     9.70,     9.43,     9.18,     6.64,
BIN4(103,1)=    5.28,     4.11,     3.35,     2.82,     2.42,     2.12,
BIN4(109,1)=    1.89,     1.67,     1.49,     1.34,     1.21,     1.11,
BIN4(115,1)=    1.02,    0.942,    0.874,    0.814,    0.761,    0.447,
BIN4(121,1)=   0.307,    0.229,    0.180,    0.147,    0.124,    0.106,
BIN4(127,1)=   0.092,    0.082,    0.073,    0.066,    0.059,    0.054,
BIN4(133,1)=   0.050,    0.046,    0.043,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:          STx                                 **
/COM, **    Decay Period (years):   900000                              **
/COM, **    Number of assemblies:   1800                                **
/COM, **    Assemblies/pkg:         12                                  **
/COM, **    Max Heat (Watts/assy):  1500.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                                **
/COM, **    Max Kinf:               1.130                               **
/COM, **    Min Kinf:               0.000                               **
/COM, **    Ave Age:                15.702
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/COM, **    Ave Burnup:            44782.169                    **
/COM, **    Ave Enrichment:        3.887                        **
/COM, **    Ave MTU/assy:          0.539                        **
/COM, **                                                        **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   877.09,   876.79,   876.48,   876.18,   875.87,   875.57,
BIN5( 7,1)=   875.27,   874.96,   874.66,   874.36,   874.05,   872.55,
BIN5(13,1)=   871.05,   869.56,   868.09,   866.62,   865.16,   863.71,
BIN5(19,1)=   862.26,   860.83,   859.40,   857.99,   856.58,   855.18,
BIN5(25,1)=   853.79,   852.40,   851.03,   849.66,   848.30,   835.67,
BIN5(31,1)=   823.70,   812.56,   801.96,   791.86,   782.20,   773.28,
BIN5(37,1)=   764.73,   755.57,   746.78,   738.71,   730.93,   723.32,
BIN5(43,1)=   715.98,   708.69,   701.65,   695.20,   688.96,   626.28,
BIN5(49,1)=   573.94,   526.99,   486.25,   449.91,   418.37,   389.00,
BIN5(55,1)=   363.42,   340.50,   319.90,   301.37,   284.74,   269.67,
BIN5(61,1)=   256.13,   243.76,   233.22,   222.65,   213.38,   154.58,
BIN5(67,1)=   125.36,   107.65,    95.77,    86.35,    78.94,    72.98,
BIN5(73,1)=    67.84,    63.15,    59.14,    55.67,    52.53,    49.54,
BIN5(79,1)=    46.89,    44.53,    42.41,    40.50,    38.70,    26.24,
BIN5(85,1)=    20.45,    17.43,    15.79,    14.83,    14.04,    13.52,
BIN5(91,1)=    13.07,    12.53,    12.06,    11.64,    11.27,    10.88,
BIN5(97,1)=    10.53,    10.21,     9.92,     9.65,     9.40,     6.85,
BIN5(103,1)=    5.48,     4.29,     3.51,     2.96,     2.56,     2.25,
BIN5(109,1)=    2.00,     1.77,     1.59,     1.43,     1.30,     1.19,
BIN5(115,1)=    1.10,     1.02,    0.946,    0.883,    0.827,    0.493,
BIN5(121,1)=   0.342,    0.257,    0.204,    0.168,    0.141,    0.122,
BIN5(127,1)=   0.106,    0.094,    0.084,    0.076,    0.069,    0.064,
BIN5(133,1)=   0.059,    0.054,    0.050,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                        **
/COM, **    Assembly Type:         BWR                          **
/COM, **    Decay Period (years):  900000                       **
/COM, **    Number of assemblies:  32097                        **
/COM, **    Assemblies/pkg:        44                           **
/COM, **    Max Heat (Watts/assy): 400.00                       **
/COM, **    Min Heat (Watts/assy): 0.00                         **
/COM, **    Max Kinf:              1.000                        **
/COM, **    Min Kinf:              0.000                        **
/COM, **    Ave Age:               17.935                       **
/COM, **    Ave Burnup:            42233.528                    **
/COM, **    Ave Enrichment:        3.327                        **
/COM, **    Ave MTU/assy:          0.174                        **
/COM, **                                                        **
/COM, ******************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   268.91,   268.82,   268.72,   268.63,   268.54,   268.44,
BIN6( 7,1)=   268.35,   268.26,   268.17,   268.07,   267.98,   267.52,
BIN6(13,1)=   267.06,   266.60,   266.15,   265.70,   265.25,   264.81,
BIN6(19,1)=   264.36,   263.92,   263.49,   263.05,   262.62,   262.19,
BIN6(25,1)=   261.76,   261.34,   260.92,   260.50,   260.08,   256.23,
BIN6(31,1)=   252.58,   249.15,   245.89,   242.81,   239.86,   237.10,
BIN6(37,1)=   234.44,   231.66,   228.98,   226.51,   224.13,   221.77,
BIN6(43,1)=   219.50,   217.29,   215.16,   213.14,   211.19,   192.09,
BIN6(49,1)=   176.12,   161.82,   149.42,   138.41,   128.82,   119.94,
BIN6(55,1)=   112.21,   105.28,    99.06,    93.48,    88.48,    83.92,
BIN6(61,1)=    79.83,    76.12,    72.94,    69.75,    66.96,    49.20,
BIN6(67,1)=    40.26,    34.78,    31.04,    28.06,    25.69,    23.78,
BIN6(73,1)=    22.11,    20.58,    19.28,    18.15,    17.12,    16.14,
BIN6(79,1)=    15.27,    14.49,    13.80,    13.17,    12.58,     8.48,
BIN6(85,1)=     6.58,     5.59,     5.06,     4.74,     4.49,     4.32,
BIN6(91,1)=     4.18,     4.01,     3.86,     3.72,     3.60,     3.48,
BIN6(97,1)=     3.36,     3.26,     3.17,     3.08,     3.00,     2.19,
BIN6(103,1)=     1.75,     1.37,     1.12,    0.943,    0.813,    0.714,
BIN6(109,1)=    0.636,    0.562,    0.501,    0.452,    0.410,    0.375,
BIN6(115,1)=    0.345,    0.319,    0.296,    0.276,    0.258,    0.152,
BIN6(121,1)=    0.105,    0.079,    0.062,    0.051,    0.043,    0.037,
BIN6(127,1)=    0.032,    0.028,    0.025,    0.023,    0.021,    0.019,
BIN6(133,1)=    0.017,    0.016,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ***************************************************************
/COM, **                                                            **
/COM, **    Assembly Type:              BWR                         **
/COM, **    Decay Period (years):       900000                      **
/COM, **    Number of assemblies:       91935                       **
/COM, **    Assemblies/pkg:             44                          **
/COM, **    Max Heat (Watts/assy):      400.00                      **
/COM, **    Min Heat (Watts/assy):      0.00                        **
/COM, **    Max Kinf:                   1.370                       **
/COM, **    Min Kinf:                   1.000                       **
/COM, **    Ave Age:                    28.192                      **
/COM, **    Ave Burnup:                 29778.716                   **
/COM, **    Ave Enrichment:             2.972                       **
/COM, **    Ave MTU/assy:               0.178                       **
/COM, **                                                            **
/COM, ***************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   153.00,   152.95,   152.91,   152.87,   152.82,   152.78,
BIN7( 7,1)=   152.74,   152.69,   152.65,   152.61,   152.56,   152.35,
BIN7(13,1)=   152.13,   151.92,   151.71,   151.50,   151.29,   151.08,
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BIN7(19,1)=   150.87,   150.66,   150.46,   150.25,   150.05,   149.85,
BIN7(25,1)=   149.65,   149.45,   149.25,   149.05,   148.85,   147.02,
BIN7(31,1)=   145.28,   143.63,   142.05,   140.53,   139.08,   137.70,
BIN7(37,1)=   136.38,   134.98,   133.63,   132.37,   131.15,   129.93,
BIN7(43,1)=   128.76,   127.61,   126.50,   125.43,   124.39,   114.31,
BIN7(49,1)=   105.69,    97.94,    91.11,    85.02,    79.64,    74.68,
BIN7(55,1)=    70.30,    66.37,    62.82,    59.63,    56.76,    54.13,
BIN7(61,1)=    51.76,    49.61,    47.73,    45.90,    44.27,    33.89,
BIN7(67,1)=    28.53,    25.21,    22.82,    20.89,    19.30,    17.97,
BIN7(73,1)=    16.75,    15.64,    14.69,    13.86,    13.07,    12.33,
BIN7(79,1)=    11.67,    11.08,    10.55,    10.08,     9.61,     6.46,
BIN7(85,1)=     4.99,     4.24,     3.83,     3.60,     3.41,     3.29,
BIN7(91,1)=     3.18,     3.05,     2.94,     2.85,     2.76,     2.67,
BIN7(97,1)=     2.59,     2.51,     2.44,     2.38,     2.32,     1.71,
BIN7(103,1)=     1.38,     1.09,    0.891,    0.754,    0.652,    0.574,
BIN7(109,1)=    0.512,    0.448,    0.397,    0.355,    0.321,    0.291,
BIN7(115,1)=    0.266,    0.245,    0.226,    0.210,    0.196,    0.112,
BIN7(121,1)=    0.075,    0.055,    0.043,    0.035,    0.029,    0.024,
BIN7(127,1)=    0.021,    0.019,    0.016,    0.015,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   1509                               **
/COM, **    Assemblies/pkg:         24                                 **
/COM, **    Max Heat (Watts/assy):  520.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.540                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                14.011                             **
/COM, **    Ave Burnup:             9886.267                           **
/COM, **    Ave Enrichment:         3.605                              **
/COM, **    Ave MTU/assy:           0.167                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    48.53,    48.52,    48.50,    48.49,    48.47,    48.45,
BIN8( 7,1)=    48.44,    48.42,    48.41,    48.39,    48.37,    48.30,
BIN8(13,1)=    48.22,    48.14,    48.06,    47.99,    47.91,    47.84,
BIN8(19,1)=    47.76,    47.69,    47.61,    47.54,    47.47,    47.39,
BIN8(25,1)=    47.32,    47.25,    47.18,    47.11,    47.03,    46.37,
BIN8(31,1)=    45.73,    45.13,    44.55,    44.00,    43.48,    42.96,
BIN8(37,1)=    42.46,    41.96,    41.48,    41.02,    40.58,    40.14,
BIN8(43,1)=    39.71,    39.29,    38.87,    38.44,    38.03,    34.42,
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BIN8(49,1)=    31.28,    28.52,    26.09,    23.94,    22.04,    20.32,
BIN8(55,1)=    18.81,    17.45,    16.25,    15.18,    14.21,    13.35,
BIN8(61,1)=    12.59,    11.91,    11.29,    10.74,    10.25,     7.41,
BIN8(67,1)=     6.23,     5.61,     5.21,     4.88,     4.60,     4.36,
BIN8(73,1)=     4.14,     3.92,     3.73,     3.57,     3.42,     3.27,
BIN8(79,1)=     3.13,     3.01,     2.90,     2.80,     2.71,     2.05,
BIN8(85,1)=     1.75,     1.59,     1.50,     1.44,     1.39,     1.35,
BIN8(91,1)=     1.31,     1.27,     1.24,     1.20,     1.18,     1.14,
BIN8(97,1)=     1.12,     1.09,     1.07,     1.04,     1.02,    0.804,
BIN8(103,1)=    0.677,    0.544,    0.455,    0.391,    0.343,    0.306,
BIN8(109,1)=    0.276,    0.240,    0.211,    0.187,    0.168,    0.151,
BIN8(115,1)=    0.137,    0.126,    0.115,    0.107,    0.099,    0.054,
BIN8(121,1)=    0.035,    0.025,    0.019,    0.015,    0.013,    0.011,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.006,    0.005,
BIN8(133,1)=    0.005,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.000 **
/COM, **                                                               **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case3.wsm                          **
/COM, **    Output File Name:       finalw3.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   28628                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                21.766                             **
/COM, **    Ave Burnup:             45788.995                          **
/COM, **    Ave Enrichment:         3.832                              **
/COM, **    Ave MTU/assy:           0.429                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   576.03,   575.88,   575.73,   575.58,   575.43,   575.28,
BIN1( 7,1)=   575.14,   574.99,   574.84,   574.69,   574.55,   573.81,
BIN1(13,1)=   573.07,   572.34,   571.62,   570.89,   570.17,   569.46,
BIN1(19,1)=   568.74,   568.03,   567.32,   566.62,   565.92,   565.22,
BIN1(25,1)=   564.53,   563.84,   563.15,   562.47,   561.78,   555.19,
BIN1(31,1)=   548.87,   542.73,   536.82,   531.10,   525.59,   520.19,
BIN1(37,1)=   514.98,   509.70,   504.59,   499.67,   494.90,   490.16,
BIN1(43,1)=   485.56,   480.98,   476.54,   472.18,   467.93,   428.04,
BIN1(49,1)=   393.42,   362.78,   335.72,   311.64,   290.19,   270.93,
BIN1(55,1)=   253.74,   238.30,   224.41,   211.90,   200.63,   190.46,
BIN1(61,1)=   181.27,   172.98,   165.45,   158.49,   152.20,   112.35,
BIN1(67,1)=    92.30,    80.26,    71.95,    65.40,    60.16,    55.89,
BIN1(73,1)=    52.12,    48.68,    45.74,    43.18,    40.81,    38.58,
BIN1(79,1)=    36.60,    34.83,    33.24,    31.80,    30.43,    21.00,
BIN1(85,1)=    16.59,    14.27,    13.00,    12.23,    11.61,    11.18,
BIN1(91,1)=    10.81,    10.37,     9.99,     9.65,     9.34,     9.02,
BIN1(97,1)=     8.73,     8.47,     8.23,     8.00,     7.79,     5.70,
BIN1(103,1)=    4.56,     3.56,     2.91,     2.45,     2.11,     1.85,
BIN1(109,1)=    1.65,     1.45,     1.29,     1.16,     1.04,     0.951,
BIN1(115,1)=    0.871,    0.802,    0.742,    0.690,    0.643,    0.371,
BIN1(121,1)=    0.251,    0.185,    0.145,    0.117,    0.098,    0.083,
BIN1(127,1)=    0.072,    0.064,    0.056,    0.051,    0.046,    0.042,
BIN1(133,1)=    0.038,    0.035,    0.033,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     54644                             **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.130                             **
/COM, **    Min Kinf:                 1.000                             **
/COM, **    Ave Age:                  21.745                            **
/COM, **    Ave Burnup:               37948.201                         **
/COM, **    Ave Enrichment:           3.767                             **
/COM, **    Ave MTU/assy:             0.430                             **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   487.66,   487.49,   487.33,   487.17,   487.01,   486.85,
BIN2( 7,1)=   486.69,   486.53,   486.37,   486.20,   486.04,   485.25,
BIN2(13,1)=   484.45,   483.66,   482.88,   482.10,   481.32,   480.55,
BIN2(19,1)=   479.79,   479.03,   478.27,   477.52,   476.77,   476.02,
BIN2(25,1)=   475.28,   474.55,   473.82,   473.09,   472.36,   465.74,
BIN2(31,1)=   459.45,   453.56,   447.93,   442.62,   437.52,   432.74,
BIN2(37,1)=   428.15,   423.26,   418.56,   414.27,   410.12,   406.03,
BIN2(43,1)=   402.08,   398.19,   394.42,   390.87,   387.43,   353.65,
BIN2(49,1)=   325.23,   299.64,   277.17,   257.15,   239.54,   223.29,
BIN2(55,1)=   208.95,   196.07,   184.48,   174.03,   164.61,   156.09,
BIN2(61,1)=   148.39,   141.44,   135.35,   129.48,   124.26,    91.59,
BIN2(67,1)=    75.70,    66.30,    59.84,    54.69,    50.51,    47.05,
BIN2(73,1)=    43.95,    41.09,    38.64,    36.50,    34.51,    32.62,
BIN2(79,1)=    30.93,    29.43,    28.07,    26.85,    25.68,    17.63,
BIN2(85,1)=    13.87,    11.90,    10.84,    10.21,     9.69,     9.34,
BIN2(91,1)=     9.04,     8.69,     8.38,     8.10,     7.85,     7.59,
BIN2(97,1)=     7.35,     7.14,     6.94,     6.76,     6.59,     4.87,
BIN2(103,1)=    3.93,     3.08,     2.52,     2.13,     1.84,     1.62,
BIN2(109,1)=    1.45,     1.27,     1.12,     1.00,    0.902,    0.819,
BIN2(115,1)=   0.748,    0.688,    0.635,    0.588,    0.548,    0.310,
BIN2(121,1)=   0.208,    0.152,    0.118,    0.095,    0.079,    0.067,
BIN2(127,1)=   0.058,    0.051,    0.045,    0.040,    0.036,    0.033,
BIN2(133,1)=   0.030,    0.028,    0.025,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     3933                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  23.388                            **
/COM, **    Ave Burnup:               17856.997                         **
/COM, **    Ave Enrichment:           3.723                             **
/COM, **    Ave MTU/assy:             0.407                             **
/COM, **                                                                **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   193.24,   193.18,   193.12,   193.06,   193.00,   192.94,
BIN3( 7,1)=   192.88,   192.82,   192.76,   192.70,   192.64,   192.34,
BIN3(13,1)=   192.04,   191.74,   191.45,   191.16,   190.86,   190.57,
BIN3(19,1)=   190.29,   190.00,   189.72,   189.43,   189.15,   188.87,
BIN3(25,1)=   188.59,   188.32,   188.04,   187.77,   187.49,   184.95,
BIN3(31,1)=   182.54,   180.26,   178.08,   175.99,   173.98,   172.05,
BIN3(37,1)=   170.20,   168.29,   166.46,   164.71,   163.03,   161.36,
BIN3(43,1)=   159.75,   158.16,   156.62,   155.10,   153.63,   139.79,
BIN3(49,1)=   127.94,   117.32,   107.93,    99.57,    92.15,    85.38,
BIN3(55,1)=    79.41,    74.04,    69.25,    64.96,    61.08,    57.62,
BIN3(61,1)=    54.51,    51.69,    49.26,    46.95,    44.92,    32.84,
BIN3(67,1)=    27.53,    24.66,    22.73,    21.17,    19.85,    18.72,
BIN3(73,1)=    17.67,    16.66,    15.80,    15.03,    14.31,    13.61,
BIN3(79,1)=    12.99,    12.43,    11.93,    11.47,    11.03,     7.98,
BIN3(85,1)=     6.56,     5.80,     5.38,     5.13,     4.91,     4.76,
BIN3(91,1)=     4.63,     4.47,     4.33,     4.21,     4.09,     3.98,
BIN3(97,1)=     3.87,     3.77,     3.68,     3.60,     3.52,     2.70,
BIN3(103,1)=     2.24,     1.79,     1.48,     1.27,     1.11,    0.981,
BIN3(109,1)=    0.881,    0.765,    0.674,    0.599,    0.537,    0.485,
BIN3(115,1)=    0.441,    0.404,    0.371,    0.343,    0.318,    0.175,
BIN3(121,1)=    0.115,    0.083,    0.063,    0.051,    0.042,    0.035,
BIN3(127,1)=    0.030,    0.026,    0.023,    0.020,    0.018,    0.017,
BIN3(133,1)=    0.015,    0.014,    0.013,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     5761                              **
/COM, **    Assemblies/pkg:           12                                **
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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                10.676                           **
/COM, **    Ave Burnup:             53713.108                        **
/COM, **    Ave Enrichment:         4.228                            **
/COM, **    Ave MTU/assy:           0.446                            **
/COM, **
/COM, ******************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   932.50,   932.10,   931.71,   931.31,   930.92,   930.52,
BIN4( 7,1)=   930.13,   929.74,   929.34,   928.95,   928.56,   926.61,
BIN4(13,1)=   924.68,   922.75,   920.84,   918.95,   917.06,   915.19,
BIN4(19,1)=   913.33,   911.49,   909.65,   907.83,   906.02,   904.22,
BIN4(25,1)=   902.44,   900.66,   898.90,   897.14,   895.40,   879.72,
BIN4(31,1)=   864.93,   851.21,   838.22,   826.20,   814.77,   804.25,
BIN4(37,1)=   794.20,   783.15,   772.58,   763.40,   754.60,   745.88,
BIN4(43,1)=   737.49,   729.37,   721.53,   714.39,   707.49,   637.87,
BIN4(49,1)=   580.98,   530.13,   486.32,   447.54,   414.00,   382.81,
BIN4(55,1)=   355.79,   331.62,   309.97,   290.56,   273.11,   257.39,
BIN4(61,1)=   243.22,   230.43,   219.55,   208.66,   199.14,   139.56,
BIN4(67,1)=   111.26,    94.64,    83.86,    75.52,    68.98,    63.82,
BIN4(73,1)=    59.44,    55.45,    52.04,    49.08,    46.45,    43.96,
BIN4(79,1)=    41.75,    39.77,    37.99,    36.39,    34.89,    24.44,
BIN4(85,1)=    19.56,    16.94,    15.49,    14.58,    13.84,    13.33,
BIN4(91,1)=    12.89,    12.35,    11.88,    11.46,    11.08,    10.69,
BIN4(97,1)=    10.34,    10.01,     9.72,     9.45,     9.20,     6.65,
BIN4(103,1)=    5.28,     4.11,     3.35,     2.81,     2.42,     2.12,
BIN4(109,1)=    1.88,     1.66,     1.48,     1.34,     1.21,     1.11,
BIN4(115,1)=    1.02,    0.940,    0.872,    0.813,    0.760,    0.447,
BIN4(121,1)=   0.307,    0.229,    0.180,    0.147,    0.124,    0.106,
BIN4(127,1)=   0.092,    0.082,    0.073,    0.066,    0.060,    0.054,
BIN4(133,1)=   0.050,    0.046,    0.043,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          STx                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   1800                               **
/COM, **    Assemblies/pkg:         12                                 **
/COM, **    Max Heat (Watts/assy):  1500.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.130                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                14.437
```

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/COM, **    Ave Burnup:            45973.889                    **
/COM, **    Ave Enrichment:        3.952                        **
/COM, **    Ave MTU/assy:          0.538                        **
/COM, **                                                        **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   920.36,   920.02,   919.69,   919.36,   919.03,   918.69,
BIN5( 7,1)=   918.36,   918.03,   917.70,   917.37,   917.04,   915.40,
BIN5(13,1)=   913.77,   912.15,   910.54,   908.93,   907.34,   905.76,
BIN5(19,1)=   904.19,   902.63,   901.08,   899.53,   898.00,   896.48,
BIN5(25,1)=   894.96,   893.46,   891.96,   890.47,   888.99,   875.41,
BIN5(31,1)=   862.56,   850.58,   839.19,   828.44,   818.18,   808.65,
BIN5(37,1)=   799.51,   789.61,   780.12,   771.56,   763.31,   755.21,
BIN5(43,1)=   747.40,   739.78,   732.42,   725.60,   719.01,   652.91,
BIN5(49,1)=   597.89,   548.54,   505.69,   467.62,   434.60,   403.75,
BIN5(55,1)=   376.97,   352.98,   331.42,   312.04,   294.62,   278.92,
BIN5(61,1)=   264.68,   251.81,   240.84,   229.75,   220.07,   158.70,
BIN5(67,1)=   128.35,   109.96,    97.70,    87.99,    80.37,    74.26,
BIN5(73,1)=    69.01,    64.23,    60.14,    56.60,    53.41,    50.37,
BIN5(79,1)=    47.67,    45.27,    43.12,    41.18,    39.35,    26.71,
BIN5(85,1)=    20.83,    17.77,    16.10,    15.12,    14.32,    13.79,
BIN5(91,1)=    13.32,    12.77,    12.29,    11.86,    11.48,    11.08,
BIN5(97,1)=    10.73,    10.40,    10.10,     9.83,     9.57,     6.97,
BIN5(103,1)=    5.57,     4.36,     3.57,     3.01,     2.60,     2.29,
BIN5(109,1)=    2.04,     1.80,     1.62,     1.46,     1.33,     1.22,
BIN5(115,1)=    1.12,     1.04,    0.966,    0.902,    0.845,    0.505,
BIN5(121,1)=   0.351,    0.264,    0.210,    0.173,    0.146,    0.126,
BIN5(127,1)=   0.110,    0.097,    0.087,    0.079,    0.072,    0.066,
BIN5(133,1)=   0.061,    0.056,    0.052,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                        **
/COM, **    Assembly Type:         BWR                          **
/COM, **    Decay Period (years):  900000                       **
/COM, **    Number of assemblies:  37931                        **
/COM, **    Assemblies/pkg:        44                           **
/COM, **    Max Heat (Watts/assy): 400.00                       **
/COM, **    Min Heat (Watts/assy): 0.00                         **
/COM, **    Max Kinf:              1.000                        **
/COM, **    Min Kinf:              0.000                        **
/COM, **    Ave Age:               14.512                       **
/COM, **    Ave Burnup:            44184.476                    **
/COM, **    Ave Enrichment:        3.446                        **
/COM, **    Ave MTU/assy:          0.174                        **
/COM, **                                                        **
/COM, ******************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   293.84,   293.74,   293.63,   293.53,   293.43,   293.33,
BIN6( 7,1)=   293.22,   293.12,   293.02,   292.92,   292.81,   292.31,
BIN6(13,1)=   291.80,   291.30,   290.80,   290.30,   289.81,   289.32,
BIN6(19,1)=   288.83,   288.35,   287.87,   287.39,   286.91,   286.44,
BIN6(25,1)=   285.97,   285.50,   285.04,   284.57,   284.11,   279.84,
BIN6(31,1)=   275.80,   272.00,   268.39,   264.94,   261.64,   258.56,
BIN6(37,1)=   255.60,   252.52,   249.56,   246.81,   244.17,   241.57,
BIN6(43,1)=   239.06,   236.59,   234.20,   231.93,   229.73,   208.56,
BIN6(49,1)=   190.80,   175.00,   161.26,   149.11,   138.51,   128.74,
BIN6(55,1)=   120.23,   112.61,   105.78,    99.64,    94.12,    89.15,
BIN6(61,1)=    84.67,    80.62,    77.13,    73.66,    70.61,    51.29,
BIN6(67,1)=    41.70,    35.84,    31.91,    28.78,    26.31,    24.32,
BIN6(73,1)=    22.61,    21.04,    19.70,    18.54,    17.49,    16.48,
BIN6(79,1)=    15.60,    14.81,    14.10,    13.46,    12.86,     8.69,
BIN6(85,1)=     6.75,     5.74,     5.19,     4.87,     4.61,     4.44,
BIN6(91,1)=     4.29,     4.11,     3.96,     3.82,     3.70,     3.57,
BIN6(97,1)=     3.45,     3.35,     3.25,     3.16,     3.08,     2.24,
BIN6(103,1)=     1.79,     1.40,     1.14,    0.964,    0.832,    0.731,
BIN6(109,1)=    0.650,    0.575,    0.514,    0.464,    0.421,    0.386,
BIN6(115,1)=    0.355,    0.328,    0.305,    0.284,    0.266,    0.158,
BIN6(121,1)=    0.109,    0.082,    0.065,    0.053,    0.045,    0.039,
BIN6(127,1)=    0.034,    0.030,    0.027,    0.024,    0.022,    0.020,
BIN6(133,1)=    0.018,    0.017,    0.016,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   85631                             **
/COM, **    Assemblies/pkg:         44                                **
/COM, **    Max Heat (Watts/assy):  400.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.370                             **
/COM, **    Min Kinf:               1.000                             **
/COM, **    Ave Age:                24.311                            **
/COM, **    Ave Burnup:             29781.140                         **
/COM, **    Ave Enrichment:         3.029                             **
/COM, **    Ave MTU/assy:           0.177                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   165.52,   165.47,   165.42,   165.37,   165.32,   165.27,
BIN7( 7,1)=   165.22,   165.17,   165.12,   165.07,   165.02,   164.78,
BIN7(13,1)=   164.53,   164.29,   164.05,   163.80,   163.57,   163.33,
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BIN7(19,1)=   163.09,   162.86,   162.62,   162.39,   162.16,   161.93,
BIN7(25,1)=   161.70,   161.47,   161.24,   161.02,   160.79,   158.71,
BIN7(31,1)=   156.72,   154.85,   153.05,   151.34,   149.70,   148.15,
BIN7(37,1)=   146.65,   145.09,   143.58,   142.16,   140.80,   139.45,
BIN7(43,1)=   138.13,   136.85,   135.61,   134.42,   133.26,   122.09,
BIN7(49,1)=   112.57,   104.03,    96.51,    89.83,    83.92,    78.50,
BIN7(55,1)=    73.72,    69.42,    65.55,    62.06,    58.91,    56.07,
BIN7(61,1)=    53.51,    51.18,    49.14,    47.16,    45.41,    34.28,
BIN7(67,1)=    28.67,    25.23,    22.80,    20.84,    19.24,    17.90,
BIN7(73,1)=    16.70,    15.58,    14.63,    13.80,    13.02,    12.28,
BIN7(79,1)=    11.62,    11.03,    10.50,    10.03,     9.57,     6.43,
BIN7(85,1)=     4.97,     4.22,     3.82,     3.59,     3.40,     3.28,
BIN7(91,1)=     3.17,     3.04,     2.93,     2.84,     2.75,     2.66,
BIN7(97,1)=     2.58,     2.50,     2.43,     2.37,     2.31,     1.71,
BIN7(103,1)=     1.38,     1.08,    0.889,    0.752,    0.651,    0.573,
BIN7(109,1)=    0.511,    0.448,    0.397,    0.355,    0.321,    0.291,
BIN7(115,1)=    0.267,    0.245,    0.226,    0.210,    0.196,    0.112,
BIN7(121,1)=    0.075,    0.055,    0.043,    0.035,    0.029,    0.025,
BIN7(127,1)=    0.021,    0.019,    0.017,    0.015,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.010,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:            BWR                             **
/COM, **    Decay Period (years):     900000                          **
/COM, **    Number of assemblies:     1927                            **
/COM, **    Assemblies/pkg:           24                              **
/COM, **    Max Heat (Watts/assy):    520.00                          **
/COM, **    Min Heat (Watts/assy):    0.00                            **
/COM, **    Max Kinf:                 1.540                           **
/COM, **    Min Kinf:                 0.000                           **
/COM, **    Ave Age:                  12.767                          **
/COM, **    Ave Burnup:               9163.556                        **
/COM, **    Ave Enrichment:           3.550                           **
/COM, **    Ave MTU/assy:             0.169                           **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    45.63,    45.62,    45.60,    45.59,    45.57,    45.56,
BIN8( 7,1)=    45.54,    45.53,    45.51,    45.50,    45.48,    45.41,
BIN8(13,1)=    45.33,    45.26,    45.19,    45.11,    45.04,    44.97,
BIN8(19,1)=    44.90,    44.82,    44.75,    44.68,    44.61,    44.54,
BIN8(25,1)=    44.47,    44.40,    44.34,    44.27,    44.20,    43.57,
BIN8(31,1)=    42.98,    42.39,    41.84,    41.32,    40.82,    40.34,
BIN8(37,1)=    39.88,    39.40,    38.94,    38.50,    38.07,    37.65,
BIN8(43,1)=    37.25,    36.85,    36.46,    36.07,    35.68,    32.25,
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BIN8(49,1)=    29.28,    26.68,    24.39,    22.36,    20.57,    18.96,
BIN8(55,1)=    17.54,    16.26,    15.13,    14.13,    13.22,    12.42,
BIN8(61,1)=    11.70,    11.07,    10.50,     9.98,     9.52,     6.87,
BIN8(67,1)=     5.77,     5.21,     4.84,     4.54,     4.28,     4.06,
BIN8(73,1)=     3.86,     3.66,     3.48,     3.33,     3.19,     3.05,
BIN8(79,1)=     2.93,     2.82,     2.72,     2.63,     2.54,     1.94,
BIN8(85,1)=     1.67,     1.52,     1.44,     1.38,     1.33,     1.30,
BIN8(91,1)=     1.26,     1.23,     1.19,     1.16,     1.14,     1.11,
BIN8(97,1)=     1.08,     1.05,     1.03,     1.01,    0.990,    0.780,
BIN8(103,1)=    0.659,    0.530,    0.444,    0.382,    0.335,    0.299,
BIN8(109,1)=    0.270,    0.234,    0.206,    0.183,    0.164,    0.148,
BIN8(115,1)=    0.134,    0.123,    0.113,    0.104,    0.096,    0.053,
BIN8(121,1)=    0.034,    0.025,    0.019,    0.015,    0.012,    0.010,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.005,    0.005,
BIN8(133,1)=    0.004,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats           **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case4.wsm                          **
/COM, **    Output File Name:       finalw4.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   28697                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                21.775                             **
/COM, **    Ave Burnup:             45791.292                          **
/COM, **    Ave Enrichment:         3.833                              **
/COM, **    Ave MTU/assy:           0.429                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   575.90,   575.75,   575.60,   575.46,   575.31,   575.16,
BIN1( 7,1)=   575.01,   574.86,   574.71,   574.57,   574.42,   573.68,
BIN1(13,1)=   572.95,   572.22,   571.49,   570.77,   570.05,   569.34,
BIN1(19,1)=   568.62,   567.91,   567.21,   566.51,   565.81,   565.11,
BIN1(25,1)=   564.42,   563.72,   563.04,   562.35,   561.67,   555.08,
BIN1(31,1)=   548.76,   542.61,   536.71,   530.99,   525.49,   520.09,
BIN1(37,1)=   514.87,   509.60,   504.50,   499.58,   494.81,   490.07,
BIN1(43,1)=   485.46,   480.89,   476.45,   472.09,   467.84,   427.96,
BIN1(49,1)=   393.35,   362.71,   335.66,   311.58,   290.14,   270.88,
BIN1(55,1)=   253.69,   238.26,   224.37,   211.86,   200.60,   190.42,
BIN1(61,1)=   181.24,   172.95,   165.42,   158.47,   152.17,   112.33,
BIN1(67,1)=    92.29,    80.24,    71.94,    65.38,    60.15,    55.88,
BIN1(73,1)=    52.11,    48.68,    45.73,    43.17,    40.81,    38.58,
BIN1(79,1)=    36.60,    34.83,    33.24,    31.80,    30.42,    21.00,
BIN1(85,1)=    16.59,    14.27,    13.00,    12.23,    11.61,    11.18,
BIN1(91,1)=    10.81,    10.37,     9.99,     9.65,     9.34,     9.02,
BIN1(97,1)=     8.73,     8.47,     8.22,     8.00,     7.79,     5.70,
BIN1(103,1)=    4.56,     3.56,     2.91,     2.45,     2.11,     1.85,
BIN1(109,1)=    1.65,     1.45,     1.29,     1.15,     1.04,    0.951,
BIN1(115,1)=   0.871,    0.802,    0.742,    0.689,    0.643,    0.371,
BIN1(121,1)=   0.251,    0.185,    0.145,    0.117,    0.098,    0.083,
BIN1(127,1)=   0.072,    0.064,    0.056,    0.051,    0.046,    0.042,
BIN1(133,1)=   0.038,    0.035,    0.033,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
```

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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     54556                             **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.130                             **
/COM, **    Min Kinf:                 1.000                             **
/COM, **    Ave Age:                  21.782                            **
/COM, **    Ave Burnup:               37935.727                         **
/COM, **    Ave Enrichment:           3.767                             **
/COM, **    Ave MTU/assy:             0.430                             **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   487.20,   487.04,   486.88,   486.72,   486.56,   486.40,
BIN2( 7,1)=   486.24,   486.08,   485.92,   485.76,   485.60,   484.80,
BIN2(13,1)=   484.01,   483.22,   482.44,   481.66,   480.89,   480.12,
BIN2(19,1)=   479.35,   478.59,   477.84,   477.09,   476.34,   475.60,
BIN2(25,1)=   474.86,   474.13,   473.40,   472.67,   471.95,   465.34,
BIN2(31,1)=   459.07,   453.18,   447.56,   442.26,   437.17,   432.40,
BIN2(37,1)=   427.81,   422.94,   418.25,   413.95,   409.81,   405.73,
BIN2(43,1)=   401.78,   397.89,   394.13,   390.59,   387.15,   353.40,
BIN2(49,1)=   325.01,   299.44,   276.99,   256.99,   239.39,   223.15,
BIN2(55,1)=   208.83,   195.96,   184.38,   173.94,   164.52,   156.02,
BIN2(61,1)=   148.32,   141.37,   135.29,   129.42,   124.21,    91.56,
BIN2(67,1)=    75.68,    66.28,    59.83,    54.68,    50.51,    47.04,
BIN2(73,1)=    43.95,    41.09,    38.63,    36.50,    34.51,    32.61,
BIN2(79,1)=    30.93,    29.42,    28.07,    26.85,    25.68,    17.63,
BIN2(85,1)=    13.87,    11.90,    10.84,    10.21,     9.69,     9.34,
BIN2(91,1)=     9.04,     8.69,     8.37,     8.10,     7.85,     7.59,
BIN2(97,1)=     7.35,     7.14,     6.94,     6.76,     6.59,     4.87,
BIN2(103,1)=     3.93,     3.08,     2.52,     2.13,     1.84,     1.62,
BIN2(109,1)=     1.45,     1.27,     1.12,     1.00,    0.902,    0.819,
BIN2(115,1)=    0.748,    0.687,    0.635,    0.588,    0.548,    0.310,
BIN2(121,1)=    0.208,    0.152,    0.118,    0.095,    0.079,    0.067,
BIN2(127,1)=    0.058,    0.051,    0.045,    0.040,    0.036,    0.033,
BIN2(133,1)=    0.030,    0.028,    0.025,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     3930                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  23.410                            **
/COM, **    Ave Burnup:               17852.651                         **
/COM, **    Ave Enrichment:           3.723                             **
/COM, **    Ave MTU/assy:             0.407                             **
/COM, **                                                                **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   193.29,   193.23,   193.17,   193.10,   193.04,   192.98,
BIN3( 7,1)=   192.92,   192.86,   192.80,   192.74,   192.68,   192.38,
BIN3(13,1)=   192.08,   191.78,   191.49,   191.19,   190.90,   190.61,
BIN3(19,1)=   190.32,   190.04,   189.75,   189.47,   189.18,   188.90,
BIN3(25,1)=   188.62,   188.35,   188.07,   187.80,   187.52,   184.98,
BIN3(31,1)=   182.56,   180.27,   178.09,   176.00,   173.99,   172.06,
BIN3(37,1)=   170.21,   168.30,   166.46,   164.71,   163.03,   161.36,
BIN3(43,1)=   159.75,   158.15,   156.61,   155.10,   153.64,   139.78,
BIN3(49,1)=   127.93,   117.31,   107.92,    99.56,    92.14,    85.36,
BIN3(55,1)=    79.40,    74.03,    69.23,    64.94,    61.06,    57.60,
BIN3(61,1)=    54.49,    51.68,    49.24,    46.94,    44.90,    32.82,
BIN3(67,1)=    27.52,    24.65,    22.72,    21.16,    19.84,    18.71,
BIN3(73,1)=    17.66,    16.66,    15.79,    15.03,    14.31,    13.61,
BIN3(79,1)=    12.99,    12.43,    11.92,    11.46,    11.02,     7.98,
BIN3(85,1)=     6.56,     5.80,     5.38,     5.12,     4.91,     4.76,
BIN3(91,1)=     4.62,     4.47,     4.33,     4.21,     4.09,     3.98,
BIN3(97,1)=     3.87,     3.77,     3.68,     3.60,     3.52,     2.70,
BIN3(103,1)=     2.24,     1.78,     1.48,     1.27,     1.11,    0.980,
BIN3(109,1)=    0.880,    0.765,    0.673,    0.599,    0.537,    0.485,
BIN3(115,1)=    0.441,    0.404,    0.371,    0.343,    0.318,    0.175,
BIN3(121,1)=    0.115,    0.083,    0.063,    0.051,    0.042,    0.035,
BIN3(127,1)=    0.030,    0.026,    0.023,    0.020,    0.018,    0.017,
BIN3(133,1)=    0.015,    0.014,    0.013,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     5750                              **
/COM, **    Assemblies/pkg:           12                                **
```

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/COM, **                                                                  **
/COM, **    Max Heat (Watts/assy):   1500.00                              **
/COM, **    Min Heat (Watts/assy):   850.00                               **
/COM, **    Max Kinf:                1.020                                **
/COM, **    Min Kinf:                0.000                                **
/COM, **    Ave Age:                 10.674                               **
/COM, **    Ave Burnup:              53710.225                            **
/COM, **    Ave Enrichment:          4.227                                **
/COM, **    Ave MTU/assy:            0.446                                **
/COM, **
/COM, ***********************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   932.67,   932.27,   931.87,   931.48,   931.08,   930.69,
BIN4( 7,1)=   930.29,   929.90,   929.51,   929.12,   928.73,   926.78,
BIN4(13,1)=   924.84,   922.92,   921.01,   919.11,   917.23,   915.35,
BIN4(19,1)=   913.50,   911.65,   909.81,   907.99,   906.18,   904.38,
BIN4(25,1)=   902.59,   900.82,   899.05,   897.30,   895.56,   879.86,
BIN4(31,1)=   865.08,   851.35,   838.35,   826.34,   814.91,   804.38,
BIN4(37,1)=   794.32,   783.26,   772.69,   763.52,   754.71,   745.98,
BIN4(43,1)=   737.60,   729.47,   721.64,   714.50,   707.59,   637.96,
BIN4(49,1)=   581.06,   530.20,   486.38,   447.59,   414.05,   382.86,
BIN4(55,1)=   355.83,   331.66,   310.01,   290.59,   273.14,   257.42,
BIN4(61,1)=   243.25,   230.46,   219.58,   208.69,   199.17,   139.58,
BIN4(67,1)=   111.27,    94.65,    83.87,    75.53,    69.00,    63.83,
BIN4(73,1)=    59.45,    55.46,    52.05,    49.09,    46.45,    43.96,
BIN4(79,1)=    41.75,    39.78,    38.00,    36.39,    34.90,    24.45,
BIN4(85,1)=    19.56,    16.94,    15.49,    14.58,    13.85,    13.34,
BIN4(91,1)=    12.89,    12.35,    11.88,    11.46,    11.08,    10.69,
BIN4(97,1)=    10.34,    10.02,     9.72,     9.45,     9.20,     6.65,
BIN4(103,1)=    5.28,     4.11,     3.35,     2.81,     2.42,     2.12,
BIN4(109,1)=    1.88,     1.66,     1.48,     1.34,     1.21,     1.11,
BIN4(115,1)=    1.02,    0.940,    0.873,    0.813,    0.760,    0.447,
BIN4(121,1)=   0.307,    0.229,    0.180,    0.147,    0.124,    0.106,
BIN4(127,1)=   0.092,    0.082,    0.073,    0.066,    0.060,    0.054,
BIN4(133,1)=   0.050,    0.046,    0.043,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                  **
/COM, **    Assembly Type:           STx                                  **
/COM, **    Decay Period (years):    900000                               **
/COM, **    Number of assemblies:    1800                                 **
/COM, **    Assemblies/pkg:          12                                   **
/COM, **    Max Heat (Watts/assy):   1500.00                              **
/COM, **    Min Heat (Watts/assy):   0.00                                 **
/COM, **    Max Kinf:                1.130                                **
/COM, **    Min Kinf:                0.000                                **
/COM, **    Ave Age:                 14.427
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/COM, **    Ave Burnup:              45973.889                    **
/COM, **    Ave Enrichment:          3.952                        **
/COM, **    Ave MTU/assy:            0.538                        **
/COM, **                                                          **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   919.67,   919.34,   919.01,   918.68,   918.35,   918.02,
BIN5( 7,1)=   917.69,   917.36,   917.03,   916.70,   916.37,   914.74,
BIN5(13,1)=   913.12,   911.51,   909.91,   908.32,   906.74,   905.17,
BIN5(19,1)=   903.61,   902.06,   900.51,   898.98,   897.46,   895.94,
BIN5(25,1)=   894.44,   892.94,   891.45,   889.98,   888.51,   874.98,
BIN5(31,1)=   862.19,   850.26,   838.92,   828.22,   818.00,   808.43,
BIN5(37,1)=   799.25,   789.41,   779.97,   771.44,   763.22,   755.13,
BIN5(43,1)=   747.32,   739.72,   732.39,   725.54,   718.90,   652.87,
BIN5(49,1)=   597.84,   548.51,   505.68,   467.61,   434.56,   403.75,
BIN5(55,1)=   376.97,   352.98,   331.42,   312.04,   294.62,   278.91,
BIN5(61,1)=   264.69,   251.81,   240.83,   229.75,   220.07,   158.71,
BIN5(67,1)=   128.35,   109.96,    97.70,    87.99,    80.37,    74.26,
BIN5(73,1)=    69.01,    64.23,    60.14,    56.60,    53.41,    50.37,
BIN5(79,1)=    47.67,    45.27,    43.12,    41.18,    39.35,    26.71,
BIN5(85,1)=    20.83,    17.77,    16.10,    15.12,    14.32,    13.79,
BIN5(91,1)=    13.32,    12.77,    12.29,    11.86,    11.48,    11.08,
BIN5(97,1)=    10.73,    10.40,    10.10,     9.83,     9.57,     6.97,
BIN5(103,1)=    5.57,     4.36,     3.57,     3.01,     2.60,     2.29,
BIN5(109,1)=    2.04,     1.80,     1.62,     1.46,     1.33,     1.22,
BIN5(115,1)=    1.12,     1.04,    0.966,    0.902,    0.845,    0.505,
BIN5(121,1)=   0.351,    0.264,    0.210,    0.173,    0.146,    0.126,
BIN5(127,1)=   0.110,    0.097,    0.087,    0.079,    0.072,    0.066,
BIN5(133,1)=   0.061,    0.056,    0.052,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                          **
/COM, **    Assembly Type:           BWR                          **
/COM, **    Decay Period (years):    900000                       **
/COM, **    Number of assemblies:    37931                        **
/COM, **    Assemblies/pkg:          44                           **
/COM, **    Max Heat (Watts/assy):   400.00                       **
/COM, **    Min Heat (Watts/assy):   0.00                         **
/COM, **    Max Kinf:                1.000                        **
/COM, **    Min Kinf:                0.000                        **
/COM, **    Ave Age:                 14.512                       **
/COM, **    Ave Burnup:              44184.476                    **
/COM, **    Ave Enrichment:          3.446                        **
/COM, **    Ave MTU/assy:            0.174                        **
/COM, **                                                          **
/COM, ******************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   293.82,   293.72,   293.61,   293.51,   293.41,   293.31,
BIN6( 7,1)=   293.20,   293.10,   293.00,   292.90,   292.79,   292.29,
BIN6(13,1)=   291.78,   291.28,   290.78,   290.28,   289.79,   289.30,
BIN6(19,1)=   288.81,   288.33,   287.85,   287.37,   286.89,   286.42,
BIN6(25,1)=   285.95,   285.49,   285.02,   284.56,   284.10,   279.83,
BIN6(31,1)=   275.78,   271.99,   268.38,   264.93,   261.64,   258.55,
BIN6(37,1)=   255.59,   252.51,   249.55,   246.81,   244.16,   241.57,
BIN6(43,1)=   239.06,   236.59,   234.20,   231.93,   229.73,   208.56,
BIN6(49,1)=   190.79,   175.00,   161.26,   149.11,   138.50,   128.74,
BIN6(55,1)=   120.23,   112.61,   105.78,    99.64,    94.12,    89.15,
BIN6(61,1)=    84.67,    80.62,    77.13,    73.66,    70.61,    51.29,
BIN6(67,1)=    41.70,    35.84,    31.91,    28.78,    26.31,    24.32,
BIN6(73,1)=    22.61,    21.04,    19.70,    18.54,    17.49,    16.48,
BIN6(79,1)=    15.60,    14.81,    14.10,    13.46,    12.86,     8.69,
BIN6(85,1)=     6.75,     5.74,     5.19,     4.87,     4.61,     4.44,
BIN6(91,1)=     4.29,     4.11,     3.96,     3.82,     3.70,     3.57,
BIN6(97,1)=     3.45,     3.35,     3.25,     3.16,     3.08,     2.24,
BIN6(103,1)=     1.79,     1.40,     1.14,    0.964,    0.832,    0.731,
BIN6(109,1)=    0.650,    0.575,    0.514,    0.464,    0.421,    0.386,
BIN6(115,1)=    0.355,    0.328,    0.305,    0.284,    0.266,    0.158,
BIN6(121,1)=    0.109,    0.082,    0.065,    0.053,    0.045,    0.039,
BIN6(127,1)=    0.034,    0.030,    0.027,    0.024,    0.022,    0.020,
BIN6(133,1)=    0.018,    0.017,    0.016,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                    **
/COM, **    Assembly Type:            BWR                                   **
/COM, **    Decay Period (years):     900000                                **
/COM, **    Number of assemblies:     85651                                 **
/COM, **    Assemblies/pkg:           44                                    **
/COM, **    Max Heat (Watts/assy):    400.00                                **
/COM, **    Min Heat (Watts/assy):    0.00                                  **
/COM, **    Max Kinf:                 1.370                                 **
/COM, **    Min Kinf:                 1.000                                 **
/COM, **    Ave Age:                  24.312                                **
/COM, **    Ave Burnup:               29783.245                             **
/COM, **    Ave Enrichment:           3.029                                 **
/COM, **    Ave MTU/assy:             0.177                                 **
/COM, **                                                                    **
/COM, ***********************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   165.52,   165.47,   165.42,   165.37,   165.32,   165.27,
BIN7( 7,1)=   165.22,   165.18,   165.13,   165.08,   165.03,   164.78,
BIN7(13,1)=   164.54,   164.29,   164.05,   163.81,   163.57,   163.33,
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BIN7(19,1)=   163.10,   162.86,   162.63,   162.39,   162.16,   161.93,
BIN7(25,1)=   161.70,   161.47,   161.25,   161.02,   160.80,   158.71,
BIN7(31,1)=   156.72,   154.85,   153.06,   151.35,   149.70,   148.15,
BIN7(37,1)=   146.66,   145.09,   143.58,   142.17,   140.81,   139.45,
BIN7(43,1)=   138.14,   136.86,   135.62,   134.42,   133.27,   122.09,
BIN7(49,1)=   112.57,   104.03,    96.52,    89.83,    83.93,    78.50,
BIN7(55,1)=    73.72,    69.42,    65.55,    62.06,    58.92,    56.08,
BIN7(61,1)=    53.51,    51.18,    49.15,    47.17,    45.41,    34.28,
BIN7(67,1)=    28.67,    25.23,    22.81,    20.84,    19.24,    17.91,
BIN7(73,1)=    16.70,    15.59,    14.63,    13.80,    13.02,    12.28,
BIN7(79,1)=    11.62,    11.03,    10.50,    10.03,     9.57,     6.43,
BIN7(85,1)=     4.97,     4.22,     3.82,     3.59,     3.40,     3.28,
BIN7(91,1)=     3.17,     3.04,     2.94,     2.84,     2.75,     2.66,
BIN7(97,1)=     2.58,     2.50,     2.43,     2.37,     2.31,     1.71,
BIN7(103,1)=     1.38,     1.08,    0.889,    0.752,    0.651,    0.573,
BIN7(109,1)=    0.511,    0.448,    0.397,    0.355,    0.321,    0.291,
BIN7(115,1)=    0.267,    0.245,    0.226,    0.210,    0.196,    0.112,
BIN7(121,1)=    0.075,    0.055,    0.043,    0.035,    0.029,    0.025,
BIN7(127,1)=    0.021,    0.019,    0.017,    0.015,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.010,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   1927                              **
/COM, **    Assemblies/pkg:         24                                **
/COM, **    Max Heat (Watts/assy):  520.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.540                             **
/COM, **    Min Kinf:               0.000                             **
/COM, **    Ave Age:                12.751                            **
/COM, **    Ave Burnup:             9163.556                          **
/COM, **    Ave Enrichment:         3.550                             **
/COM, **    Ave MTU/assy:           0.169                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    45.64,    45.63,    45.61,    45.60,    45.58,    45.57,
BIN8( 7,1)=    45.55,    45.54,    45.52,    45.50,    45.49,    45.41,
BIN8(13,1)=    45.34,    45.27,    45.19,    45.12,    45.05,    44.97,
BIN8(19,1)=    44.90,    44.83,    44.76,    44.69,    44.62,    44.55,
BIN8(25,1)=    44.48,    44.41,    44.34,    44.28,    44.21,    43.58,
BIN8(31,1)=    42.98,    42.40,    41.85,    41.33,    40.83,    40.35,
BIN8(37,1)=    39.88,    39.41,    38.95,    38.51,    38.08,    37.66,
BIN8(43,1)=    37.26,    36.86,    36.47,    36.07,    35.69,    32.26,
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BIN8(49,1)=    29.29,    26.68,    24.40,    22.36,    20.57,    18.96,
BIN8(55,1)=    17.54,    16.26,    15.13,    14.13,    13.22,    12.42,
BIN8(61,1)=    11.71,    11.07,    10.50,     9.98,     9.52,     6.87,
BIN8(67,1)=     5.77,     5.21,     4.84,     4.54,     4.28,     4.06,
BIN8(73,1)=     3.86,     3.66,     3.48,     3.33,     3.19,     3.05,
BIN8(79,1)=     2.93,     2.82,     2.72,     2.63,     2.54,     1.94,
BIN8(85,1)=     1.67,     1.52,     1.44,     1.38,     1.33,     1.30,
BIN8(91,1)=     1.26,     1.23,     1.19,     1.16,     1.14,     1.11,
BIN8(97,1)=     1.08,     1.05,     1.03,     1.01,    0.990,    0.780,
BIN8(103,1)=    0.659,    0.530,    0.444,    0.382,    0.335,    0.299,
BIN8(109,1)=    0.270,    0.234,    0.206,    0.183,    0.164,    0.148,
BIN8(115,1)=    0.134,    0.123,    0.113,    0.104,    0.096,    0.053,
BIN8(121,1)=    0.034,    0.025,    0.019,    0.015,    0.012,    0.010,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.005,    0.005,
BIN8(133,1)=    0.004,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case5.wsm                          **
/COM, **    Output File Name:       finalw5.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   33596                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                24.831                             **
/COM, **    Ave Burnup:             44901.848                          **
/COM, **    Ave Enrichment:         3.765                              **
/COM, **    Ave MTU/assy:           0.430                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   535.94,   535.82,   535.70,   535.58,   535.45,   535.33,
BIN1( 7,1)=   535.21,   535.09,   534.97,   534.84,   534.72,   534.11,
BIN1(13,1)=   533.51,   532.91,   532.31,   531.71,   531.11,   530.52,
BIN1(19,1)=   529.93,   529.34,   528.75,   528.17,   527.59,   527.01,
BIN1(25,1)=   526.43,   525.86,   525.28,   524.71,   524.15,   518.54,
BIN1(31,1)=   513.14,   507.83,   502.70,   497.65,   492.76,   487.92,
BIN1(37,1)=   483.23,   478.57,   474.04,   469.58,   465.25,   460.93,
BIN1(43,1)=   456.73,   452.57,   448.52,   444.50,   440.58,   404.09,
BIN1(49,1)=   371.98,   343.66,   318.59,   296.20,   276.17,   258.30,
BIN1(55,1)=   242.28,   227.88,   214.94,   203.28,   192.73,   183.18,
BIN1(61,1)=   174.58,   166.86,   159.73,   153.24,   147.32,   109.77,
BIN1(67,1)=    90.64,    79.09,    71.01,    64.63,    59.52,    55.33,
BIN1(73,1)=    51.59,    48.21,    45.31,    42.78,    40.42,    38.22,
BIN1(79,1)=    36.26,    34.51,    32.93,    31.50,    30.13,    20.78,
BIN1(85,1)=    16.40,    14.10,    12.84,    12.08,    11.46,    11.05,
BIN1(91,1)=    10.68,    10.25,     9.87,     9.53,     9.23,     8.91,
BIN1(97,1)=     8.63,     8.37,     8.13,     7.91,     7.71,     5.64,
BIN1(103,1)=    4.51,     3.53,     2.88,     2.43,     2.10,     1.84,
BIN1(109,1)=    1.64,     1.44,     1.28,     1.14,     1.03,    0.941,
BIN1(115,1)=   0.861,    0.793,    0.733,    0.681,    0.635,    0.365,
BIN1(121,1)=   0.247,    0.182,    0.142,    0.115,    0.096,    0.082,
BIN1(127,1)=   0.071,    0.062,    0.055,    0.049,    0.045,    0.041,
BIN1(133,1)=   0.037,    0.034,    0.032,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                   **
/COM, **    Assembly Type:              PWR                                **
/COM, **    Decay Period (years):       900000                             **
/COM, **    Number of assemblies:       55652                              **
/COM, **    Assemblies/pkg:             21                                 **
/COM, **    Max Heat (Watts/assy):      850.00                             **
/COM, **    Min Heat (Watts/assy):      0.00                               **
/COM, **    Max Kinf:                   1.130                              **
/COM, **    Min Kinf:                   1.000                              **
/COM, **    Ave Age:                    28.530                             **
/COM, **    Ave Burnup:                 35777.806                          **
/COM, **    Ave Enrichment:             3.568                              **
/COM, **    Ave MTU/assy:               0.431                              **
/COM, **                                                                   **
/COM, ***********************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   397.69,   397.60,   397.50,   397.40,   397.31,   397.21,
BIN2( 7,1)=   397.11,   397.02,   396.92,   396.82,   396.73,   396.25,
BIN2(13,1)=   395.77,   395.29,   394.82,   394.35,   393.88,   393.41,
BIN2(19,1)=   392.95,   392.49,   392.03,   391.57,   391.11,   390.66,
BIN2(25,1)=   390.20,   389.75,   389.31,   388.86,   388.41,   384.13,
BIN2(31,1)=   380.01,   376.02,   372.18,   368.44,   364.82,   361.30,
BIN2(37,1)=   357.89,   354.43,   351.07,   347.83,   344.68,   341.55,
BIN2(43,1)=   338.51,   335.51,   332.59,   329.72,   326.91,   300.48,
BIN2(49,1)=   277.36,   256.77,   238.51,   222.20,   207.57,   194.39,
BIN2(55,1)=   182.61,   172.01,   162.47,   153.84,   146.04,   138.98,
BIN2(61,1)=   132.62,   126.90,   121.67,   116.86,   112.50,    85.00,
BIN2(67,1)=    71.17,    62.86,    56.93,    52.20,    48.32,    45.08,
BIN2(73,1)=    42.11,    39.41,    37.09,    35.06,    33.13,    31.32,
BIN2(79,1)=    29.71,    28.27,    26.98,    25.81,    24.67,    16.94,
BIN2(85,1)=    13.32,    11.43,    10.41,     9.80,     9.31,     8.98,
BIN2(91,1)=     8.68,     8.35,     8.05,     7.79,     7.55,     7.30,
BIN2(97,1)=     7.07,     6.87,     6.68,     6.51,     6.34,     4.69,
BIN2(103,1)=    3.79,     2.97,     2.44,     2.06,     1.78,     1.57,
BIN2(109,1)=    1.40,     1.22,     1.08,    0.963,    0.867,    0.787,
BIN2(115,1)=   0.718,    0.659,    0.608,    0.563,    0.523,    0.295,
BIN2(121,1)=   0.196,    0.143,    0.111,    0.089,    0.074,    0.062,
BIN2(127,1)=   0.054,    0.047,    0.042,    0.037,    0.033,    0.030,
BIN2(133,1)=   0.028,    0.025,    0.023,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ***********************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     2606                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  36.991                            **
/COM, **    Ave Burnup:               17240.930                         **
/COM, **    Ave Enrichment:           3.414                             **
/COM, **    Ave MTU/assy:             0.389                             **
/COM, **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   134.55,   134.52,   134.49,   134.46,   134.43,   134.40,
BIN3( 7,1)=   134.37,   134.34,   134.31,   134.28,   134.25,   134.10,
BIN3(13,1)=   133.95,   133.80,   133.66,   133.51,   133.36,   133.22,
BIN3(19,1)=   133.07,   132.93,   132.79,   132.64,   132.50,   132.36,
BIN3(25,1)=   132.22,   132.08,   131.94,   131.80,   131.66,   130.31,
BIN3(31,1)=   129.01,   127.74,   126.51,   125.33,   124.18,   123.01,
BIN3(37,1)=   121.88,   120.76,   119.67,   118.60,   117.56,   116.53,
BIN3(43,1)=   115.52,   114.54,   113.58,   112.59,   111.63,   102.73,
BIN3(49,1)=    94.88,    87.86,    81.60,    76.00,    70.99,    66.48,
BIN3(55,1)=    62.46,    58.84,    55.60,    52.67,    50.04,    47.67,
BIN3(61,1)=    45.55,    43.62,    41.90,    40.33,    38.92,    30.25,
BIN3(67,1)=    26.09,    23.69,    21.91,    20.46,    19.21,    18.13,
BIN3(73,1)=    17.08,    16.12,    15.30,    14.57,    13.84,    13.17,
BIN3(79,1)=    12.57,    12.03,    11.54,    11.09,    10.66,     7.70,
BIN3(85,1)=     6.32,     5.58,     5.17,     4.92,     4.71,     4.57,
BIN3(91,1)=     4.43,     4.28,     4.15,     4.03,     3.93,     3.81,
BIN3(97,1)=     3.71,     3.61,     3.53,     3.45,     3.37,     2.59,
BIN3(103,1)=     2.14,     1.71,     1.42,     1.21,     1.05,    0.935,
BIN3(109,1)=    0.839,    0.728,    0.639,    0.567,    0.508,    0.458,
BIN3(115,1)=    0.416,    0.380,    0.349,    0.322,    0.298,    0.163,
BIN3(121,1)=    0.106,    0.076,    0.058,    0.046,    0.038,    0.032,
BIN3(127,1)=    0.027,    0.024,    0.021,    0.018,    0.017,    0.015,
BIN3(133,1)=    0.014,    0.012,    0.011,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     1196                              **
/COM, **    Assemblies/pkg:           12                                **
```

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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                11.728                           **
/COM, **    Ave Burnup:             52771.906                        **
/COM, **    Ave Enrichment:         4.244                            **
/COM, **    Ave MTU/assy:           0.468                            **
/COM, **
/COM, ******************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   912.02,   911.66,   911.30,   910.94,   910.58,   910.22,
BIN4( 7,1)=   909.87,   909.51,   909.15,   908.80,   908.44,   906.67,
BIN4(13,1)=   904.92,   903.17,   901.43,   899.71,   898.00,   896.30,
BIN4(19,1)=   894.60,   892.92,   891.25,   889.59,   887.94,   886.31,
BIN4(25,1)=   884.68,   883.06,   881.45,   879.85,   878.26,   863.91,
BIN4(31,1)=   850.34,   837.77,   825.83,   814.77,   804.23,   794.28,
BIN4(37,1)=   784.76,   774.37,   764.42,   755.56,   747.04,   738.66,
BIN4(43,1)=   730.59,   722.88,   715.44,   708.33,   701.45,   634.30,
BIN4(49,1)=   578.32,   528.68,   485.54,   447.57,   414.16,   383.54,
BIN4(55,1)=   356.82,   332.90,   311.45,   292.20,   274.88,   259.27,
BIN4(61,1)=   245.19,   232.64,   221.57,   210.82,   201.34,   141.93,
BIN4(67,1)=   113.53,    96.84,    85.95,    77.50,    70.87,    65.60,
BIN4(73,1)=    61.11,    57.02,    53.52,    50.49,    47.78,    45.21,
BIN4(79,1)=    42.93,    40.89,    39.06,    37.40,    35.86,    25.08,
BIN4(85,1)=    20.04,    17.34,    15.85,    14.92,    14.17,    13.65,
BIN4(91,1)=    13.19,    12.64,    12.16,    11.73,    11.35,    10.95,
BIN4(97,1)=    10.59,    10.26,     9.96,     9.69,     9.43,     6.83,
BIN4(103,1)=    5.43,     4.23,     3.45,     2.90,     2.50,     2.19,
BIN4(109,1)=    1.94,     1.72,     1.53,     1.38,     1.25,     1.14,
BIN4(115,1)=    1.05,    0.967,    0.897,    0.836,    0.781,    0.458,
BIN4(121,1)=   0.314,    0.234,    0.184,    0.150,    0.126,    0.108,
BIN4(127,1)=   0.094,    0.083,    0.074,    0.067,    0.061,    0.055,
BIN4(133,1)=   0.051,    0.047,    0.044,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                             **
/COM, **    Assembly Type:          STx                              **
/COM, **    Decay Period (years):   900000                           **
/COM, **    Number of assemblies:   1757                             **
/COM, **    Assemblies/pkg:         12                               **
/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  0.00                             **
/COM, **    Max Kinf:               1.130                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                19.450                           **
```

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/COM, **    Ave Burnup:            40410.796                    **
/COM, **    Ave Enrichment:        3.582                        **
/COM, **    Ave MTU/assy:          0.539                        **
/COM, **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   698.81,   698.65,   698.50,   698.34,   698.18,   698.03,
BIN5( 7,1)=   697.87,   697.72,   697.56,   697.40,   697.25,   696.48,
BIN5(13,1)=   695.70,   694.94,   694.17,   693.41,   692.65,   691.89,
BIN5(19,1)=   691.14,   690.39,   689.64,   688.90,   688.15,   687.42,
BIN5(25,1)=   686.68,   685.95,   685.21,   684.49,   683.76,   676.64,
BIN5(31,1)=   669.78,   662.92,   656.30,   649.74,   643.40,   637.07,
BIN5(37,1)=   630.94,   624.77,   618.79,   612.91,   607.20,   601.51,
BIN5(43,1)=   595.98,   590.52,   585.21,   579.95,   574.84,   526.35,
BIN5(49,1)=   483.78,   446.29,   413.30,   383.59,   357.17,   333.68,
BIN5(55,1)=   312.62,   293.70,   276.69,   261.36,   247.52,   235.02,
BIN5(61,1)=   223.92,   213.87,   204.44,   195.96,   188.22,   138.96,
BIN5(67,1)=   113.90,    98.60,    88.11,    79.75,    73.11,    67.72,
BIN5(73,1)=    63.00,    58.70,    55.01,    51.82,    48.89,    46.10,
BIN5(79,1)=    43.64,    41.44,    39.47,    37.69,    36.00,    24.36,
BIN5(85,1)=    18.95,    16.13,    14.61,    13.72,    12.99,    12.51,
BIN5(91,1)=    12.10,    11.60,    11.17,    10.79,    10.44,    10.09,
BIN5(97,1)=     9.77,     9.47,     9.21,     8.96,     8.73,     6.38,
BIN5(103,1)=    5.11,     4.00,     3.28,     2.77,     2.39,     2.10,
BIN5(109,1)=    1.87,     1.66,     1.48,     1.33,     1.21,     1.10,
BIN5(115,1)=    1.02,    0.939,    0.872,    0.812,    0.760,    0.449,
BIN5(121,1)=   0.309,    0.231,    0.183,    0.150,    0.126,    0.108,
BIN5(127,1)=   0.094,    0.083,    0.074,    0.067,    0.061,    0.056,
BIN5(133,1)=   0.051,    0.048,    0.044,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          BWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   28493                              **
/COM, **    Assemblies/pkg:         44                                 **
/COM, **    Max Heat (Watts/assy):  400.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                18.862                             **
/COM, **    Ave Burnup:             41588.594                          **
/COM, **    Ave Enrichment:         3.274                              **
/COM, **    Ave MTU/assy:           0.174                              **
/COM, **
/COM, ******************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   251.87,   251.80,   251.73,   251.66,   251.59,   251.52,
BIN6( 7,1)=   251.46,   251.39,   251.32,   251.25,   251.18,   250.85,
BIN6(13,1)=   250.51,   250.17,   249.84,   249.51,   249.18,   248.85,
BIN6(19,1)=   248.52,   248.20,   247.87,   247.55,   247.23,   246.91,
BIN6(25,1)=   246.59,   246.28,   245.96,   245.65,   245.34,   242.32,
BIN6(31,1)=   239.44,   236.66,   233.99,   231.42,   228.94,   226.51,
BIN6(37,1)=   224.17,   221.79,   219.49,   217.25,   215.09,   212.96,
BIN6(43,1)=   210.90,   208.86,   206.88,   204.94,   203.06,   185.39,
BIN6(49,1)=   170.03,   156.55,   144.70,   134.21,   124.86,   116.50,
BIN6(55,1)=   109.08,   102.43,    96.47,    91.10,    86.26,    81.89,
BIN6(61,1)=    77.96,    74.48,    71.25,    68.27,    65.58,    48.44,
BIN6(67,1)=    39.74,    34.38,    30.71,    27.78,    25.45,    23.56,
BIN6(73,1)=    21.91,    20.40,    19.11,    17.99,    16.97,    16.00,
BIN6(79,1)=    15.14,    14.37,    13.68,    13.06,    12.47,     8.41,
BIN6(85,1)=     6.52,     5.54,     5.01,     4.70,     4.45,     4.28,
BIN6(91,1)=     4.14,     3.97,     3.82,     3.69,     3.57,     3.44,
BIN6(97,1)=     3.33,     3.23,     3.14,     3.06,     2.98,     2.17,
BIN6(103,1)=     1.73,     1.36,     1.11,    0.935,    0.807,    0.708,
BIN6(109,1)=    0.631,    0.557,    0.497,    0.448,    0.406,    0.371,
BIN6(115,1)=    0.341,    0.315,    0.293,    0.273,    0.255,    0.150,
BIN6(121,1)=    0.103,    0.077,    0.061,    0.050,    0.042,    0.036,
BIN6(127,1)=    0.031,    0.028,    0.025,    0.022,    0.020,    0.019,
BIN6(133,1)=    0.017,    0.016,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:            BWR                             **
/COM, **    Decay Period (years):     900000                          **
/COM, **    Number of assemblies:     94639                           **
/COM, **    Assemblies/pkg:           44                              **
/COM, **    Max Heat (Watts/assy):    400.00                          **
/COM, **    Min Heat (Watts/assy):    0.00                            **
/COM, **    Max Kinf:                 1.370                           **
/COM, **    Min Kinf:                 1.000                           **
/COM, **    Ave Age:                  30.205                          **
/COM, **    Ave Burnup:               29049.082                       **
/COM, **    Ave Enrichment:           2.884                           **
/COM, **    Ave MTU/assy:             0.179                           **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   143.99,   143.96,   143.92,   143.89,   143.86,   143.82,
BIN7( 7,1)=   143.79,   143.76,   143.72,   143.69,   143.66,   143.49,
BIN7(13,1)=   143.32,   143.16,   143.00,   142.83,   142.67,   142.51,
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BIN7(19,1)=   142.35,   142.19,   142.03,   141.87,   141.71,   141.55,
BIN7(25,1)=   141.40,   141.24,   141.09,   140.93,   140.78,   139.27,
BIN7(31,1)=   137.83,   136.42,   135.07,   133.75,   132.48,   131.23,
BIN7(37,1)=   130.02,   128.81,   127.64,   126.49,   125.37,   124.26,
BIN7(43,1)=   123.19,   122.12,   121.08,   120.06,   119.06,   109.70,
BIN7(49,1)=   101.49,    94.20,    87.73,    81.95,    76.76,    72.11,
BIN7(55,1)=    67.95,    64.22,    60.86,    57.82,    55.06,    52.56,
BIN7(61,1)=    50.31,    48.29,    46.44,    44.73,    43.17,    33.24,
BIN7(67,1)=    28.07,    24.86,    22.52,    20.63,    19.07,    17.77,
BIN7(73,1)=    16.57,    15.47,    14.53,    13.72,    12.93,    12.20,
BIN7(79,1)=    11.54,    10.96,    10.44,     9.97,     9.51,     6.39,
BIN7(85,1)=     4.93,     4.19,     3.79,     3.56,     3.37,     3.25,
BIN7(91,1)=     3.14,     3.02,     2.91,     2.81,     2.73,     2.64,
BIN7(97,1)=     2.56,     2.48,     2.41,     2.35,     2.29,     1.70,
BIN7(103,1)=     1.37,     1.08,    0.882,    0.746,    0.646,    0.568,
BIN7(109,1)=    0.507,    0.443,    0.393,    0.351,    0.317,    0.288,
BIN7(115,1)=    0.263,    0.242,    0.223,    0.207,    0.193,    0.109,
BIN7(121,1)=    0.073,    0.054,    0.042,    0.034,    0.028,    0.024,
BIN7(127,1)=    0.021,    0.018,    0.016,    0.014,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:           BWR                              **
/COM, **    Decay Period (years):    900000                           **
/COM, **    Number of assemblies:    993                              **
/COM, **    Assemblies/pkg:          24                               **
/COM, **    Max Heat (Watts/assy):   520.00                           **
/COM, **    Min Heat (Watts/assy):   0.00                             **
/COM, **    Max Kinf:                1.540                            **
/COM, **    Min Kinf:                0.000                            **
/COM, **    Ave Age:                 18.118                           **
/COM, **    Ave Burnup:              8835.600                         **
/COM, **    Ave Enrichment:          3.468                            **
/COM, **    Ave MTU/assy:            0.165                            **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    38.92,    38.91,    38.90,    38.89,    38.88,    38.87,
BIN8( 7,1)=    38.86,    38.85,    38.84,    38.83,    38.81,    38.76,
BIN8(13,1)=    38.71,    38.65,    38.60,    38.55,    38.49,    38.44,
BIN8(19,1)=    38.39,    38.34,    38.29,    38.23,    38.18,    38.13,
BIN8(25,1)=    38.08,    38.03,    37.98,    37.93,    37.88,    37.40,
BIN8(31,1)=    36.94,    36.49,    36.07,    35.65,    35.25,    34.85,
BIN8(37,1)=    34.46,    34.06,    33.68,    33.32,    32.97,    32.63,
BIN8(43,1)=    32.30,    31.96,    31.64,    31.31,    31.00,    28.09,
```

```
BIN8(49,1)=    25.55,    23.33,    21.37,    19.64,    18.09,    16.72,
BIN8(55,1)=    15.50,    14.41,    13.44,    12.58,    11.80,    11.12,
BIN8(61,1)=    10.51,     9.96,     9.47,     9.03,     8.63,     6.36,
BIN8(67,1)=     5.40,     4.90,     4.56,     4.29,     4.06,     3.85,
BIN8(73,1)=     3.66,     3.48,     3.31,     3.17,     3.04,     2.92,
BIN8(79,1)=     2.80,     2.70,     2.60,     2.52,     2.44,     1.88,
BIN8(85,1)=     1.62,     1.48,     1.40,     1.35,     1.30,     1.26,
BIN8(91,1)=     1.23,     1.20,     1.16,     1.13,     1.11,     1.08,
BIN8(97,1)=     1.05,     1.03,     1.01,    0.986,    0.966,    0.762,
BIN8(103,1)=    0.644,    0.518,    0.434,    0.373,    0.328,    0.292,
BIN8(109,1)=    0.264,    0.229,    0.201,    0.178,    0.160,    0.144,
BIN8(115,1)=    0.131,    0.119,    0.110,    0.101,    0.094,    0.051,
BIN8(121,1)=    0.033,    0.024,    0.018,    0.014,    0.012,    0.010,
BIN8(127,1)=    0.008,    0.007,    0.006,    0.006,    0.005,    0.005,
BIN8(133,1)=    0.004,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
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```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats           **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case6.wsm                          **
/COM, **    Output File Name:       finalw6.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   33551                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                24.498                             **
/COM, **    Ave Burnup:             44913.941                          **
/COM, **    Ave Enrichment:         3.760                              **
/COM, **    Ave MTU/assy:           0.430                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   539.73,   539.60,   539.47,   539.35,   539.22,   539.10,
BIN1( 7,1)=   538.97,   538.85,   538.72,   538.60,   538.47,   537.85,
BIN1(13,1)=   537.24,   536.62,   536.01,   535.39,   534.79,   534.18,
BIN1(19,1)=   533.58,   532.97,   532.38,   531.78,   531.19,   530.59,
BIN1(25,1)=   530.00,   529.42,   528.83,   528.25,   527.67,   521.96,
BIN1(31,1)=   516.47,   511.09,   505.90,   500.78,   495.83,   490.93,
BIN1(37,1)=   486.18,   481.45,   476.87,   472.36,   467.99,   463.63,
BIN1(43,1)=   459.40,   455.20,   451.11,   447.05,   443.09,   406.29,
BIN1(49,1)=   373.94,   345.40,   320.14,   297.60,   277.44,   259.45,
BIN1(55,1)=   243.32,   228.83,   215.81,   204.08,   193.46,   183.85,
BIN1(61,1)=   175.21,   167.45,   160.27,   153.75,   147.80,   110.05,
BIN1(67,1)=    90.85,    79.26,    71.16,    64.76,    59.63,    55.43,
BIN1(73,1)=    51.69,    48.30,    45.39,    42.86,    40.50,    38.28,
BIN1(79,1)=    36.32,    34.56,    32.98,    31.55,    30.18,    20.81,
BIN1(85,1)=    16.42,    14.11,    12.85,    12.09,    11.48,    11.06,
BIN1(91,1)=    10.69,    10.26,     9.88,     9.54,     9.24,     8.92,
BIN1(97,1)=     8.64,     8.38,     8.14,     7.92,     7.71,     5.64,
BIN1(103,1)=     4.52,     3.53,     2.88,     2.43,     2.10,     1.84,
BIN1(109,1)=     1.64,     1.44,     1.28,     1.14,     1.03,    0.941,
BIN1(115,1)=    0.862,    0.793,    0.734,    0.681,    0.635,    0.365,
BIN1(121,1)=    0.247,    0.182,    0.142,    0.115,    0.096,    0.082,
BIN1(127,1)=    0.071,    0.062,    0.055,    0.049,    0.045,    0.041,
BIN1(133,1)=    0.037,    0.034,    0.032,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     55376                             **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.130                             **
/COM, **    Min Kinf:                 1.000                             **
/COM, **    Ave Age:                  28.110                            **
/COM, **    Ave Burnup:               35839.658                         **
/COM, **    Ave Enrichment:           3.579                             **
/COM, **    Ave MTU/assy:             0.431                             **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   401.64,   401.54,   401.44,   401.34,   401.25,   401.15,
BIN2( 7,1)=   401.05,   400.95,   400.85,   400.75,   400.65,   400.15,
BIN2(13,1)=   399.66,   399.17,   398.69,   398.20,   397.72,   397.24,
BIN2(19,1)=   396.76,   396.28,   395.81,   395.34,   394.87,   394.40,
BIN2(25,1)=   393.93,   393.47,   393.01,   392.55,   392.09,   387.68,
BIN2(31,1)=   383.45,   379.37,   375.45,   371.63,   367.95,   364.35,
BIN2(37,1)=   360.88,   357.36,   353.95,   350.65,   347.45,   344.28,
BIN2(43,1)=   341.21,   338.17,   335.21,   332.29,   329.45,   302.69,
BIN2(49,1)=   279.34,   258.52,   240.08,   223.60,   208.85,   195.54,
BIN2(55,1)=   183.64,   172.94,   163.31,   154.60,   146.72,   139.60,
BIN2(61,1)=   133.18,   127.40,   122.15,   117.29,   112.89,    85.18,
BIN2(67,1)=    71.27,    62.92,    56.99,    52.25,    48.36,    45.11,
BIN2(73,1)=    42.14,    39.44,    37.11,    35.09,    33.16,    31.34,
BIN2(79,1)=    29.73,    28.29,    27.00,    25.82,    24.69,    16.95,
BIN2(85,1)=    13.32,    11.44,    10.41,     9.81,     9.31,     8.98,
BIN2(91,1)=     8.69,     8.35,     8.05,     7.79,     7.55,     7.30,
BIN2(97,1)=     7.08,     6.87,     6.68,     6.51,     6.34,     4.70,
BIN2(103,1)=     3.79,     2.97,     2.44,     2.06,     1.78,     1.57,
BIN2(109,1)=     1.40,     1.22,     1.08,    0.964,    0.868,    0.787,
BIN2(115,1)=    0.718,    0.659,    0.608,    0.563,    0.524,    0.295,
BIN2(121,1)=    0.197,    0.143,    0.111,    0.089,    0.074,    0.063,
BIN2(127,1)=    0.054,    0.047,    0.042,    0.037,    0.034,    0.030,
BIN2(133,1)=    0.028,    0.025,    0.024,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     2910                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  34.559                            **
/COM, **    Ave Burnup:               17623.981                         **
/COM, **    Ave Enrichment:           3.506                             **
/COM, **    Ave MTU/assy:             0.390                             **
/COM, **                                                                **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   148.91,   148.87,   148.83,   148.79,   148.75,   148.72,
BIN3( 7,1)=   148.68,   148.64,   148.60,   148.56,   148.52,   148.33,
BIN3(13,1)=   148.14,   147.95,   147.76,   147.57,   147.38,   147.19,
BIN3(19,1)=   147.01,   146.82,   146.64,   146.45,   146.27,   146.09,
BIN3(25,1)=   145.91,   145.73,   145.55,   145.37,   145.20,   143.52,
BIN3(31,1)=   141.91,   140.36,   138.88,   137.44,   136.05,   134.70,
BIN3(37,1)=   133.40,   132.07,   130.79,   129.55,   128.34,   127.16,
BIN3(43,1)=   126.01,   124.87,   123.76,   122.65,   121.57,   111.48,
BIN3(49,1)=   102.70,    94.83,    87.84,    81.59,    76.03,    70.99,
BIN3(55,1)=    66.52,    62.50,    58.89,    55.65,    52.73,    50.10,
BIN3(61,1)=    47.75,    45.62,    43.74,    41.99,    40.43,    30.94,
BIN3(67,1)=    26.51,    24.00,    22.16,    20.69,    19.41,    18.32,
BIN3(73,1)=    17.26,    16.29,    15.45,    14.71,    13.98,    13.30,
BIN3(79,1)=    12.69,    12.14,    11.65,    11.20,    10.76,     7.77,
BIN3(85,1)=     6.37,     5.63,     5.21,     4.96,     4.75,     4.61,
BIN3(91,1)=     4.47,     4.32,     4.19,     4.07,     3.96,     3.84,
BIN3(97,1)=     3.74,     3.64,     3.56,     3.48,     3.40,     2.61,
BIN3(103,1)=     2.16,     1.72,     1.43,     1.22,     1.06,    0.942,
BIN3(109,1)=    0.845,    0.734,    0.645,    0.572,    0.513,    0.463,
BIN3(115,1)=    0.421,    0.384,    0.353,    0.326,    0.302,    0.165,
BIN3(121,1)=    0.108,    0.078,    0.059,    0.047,    0.039,    0.033,
BIN3(127,1)=    0.028,    0.024,    0.021,    0.019,    0.017,    0.015,
BIN3(133,1)=    0.014,    0.013,    0.012,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     971                               **
/COM, **    Assemblies/pkg:           12                                **
```

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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                12.057                           **
/COM, **    Ave Burnup:             54174.739                        **
/COM, **    Ave Enrichment:         4.367                            **
/COM, **    Ave MTU/assy:           0.458                            **
/COM, **                                                             **
/COM, ******************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   915.39,   915.04,   914.69,   914.34,   913.99,   913.65,
BIN4( 7,1)=   913.30,   912.96,   912.61,   912.26,   911.92,   910.20,
BIN4(13,1)=   908.50,   906.80,   905.12,   903.44,   901.78,   900.12,
BIN4(19,1)=   898.48,   896.85,   895.22,   893.61,   892.01,   890.41,
BIN4(25,1)=   888.83,   887.25,   885.69,   884.13,   882.58,   868.50,
BIN4(31,1)=   855.18,   842.87,   831.17,   820.08,   809.50,   799.55,
BIN4(37,1)=   790.02,   779.74,   769.89,   761.01,   752.46,   744.14,
BIN4(43,1)=   736.13,   728.33,   720.81,   713.55,   706.53,   639.04,
BIN4(49,1)=   582.32,   532.28,   488.68,   450.35,   416.43,   385.62,
BIN4(55,1)=   358.63,   334.46,   312.80,   293.37,   275.87,   260.12,
BIN4(61,1)=   245.90,   233.26,   221.99,   211.19,   201.62,   141.61,
BIN4(67,1)=   112.91,    96.07,    85.12,    76.65,    70.03,    64.80,
BIN4(73,1)=    60.35,    56.32,    52.86,    49.87,    47.20,    44.68,
BIN4(79,1)=    42.45,    40.45,    38.65,    37.03,    35.51,    24.95,
BIN4(85,1)=    20.00,    17.35,    15.87,    14.95,    14.19,    13.67,
BIN4(91,1)=    13.21,    12.66,    12.18,    11.75,    11.36,    10.96,
BIN4(97,1)=    10.60,    10.27,     9.97,     9.69,     9.43,     6.82,
BIN4(103,1)=    5.41,     4.21,     3.43,     2.89,     2.48,     2.18,
BIN4(109,1)=    1.93,     1.71,     1.52,     1.37,     1.25,     1.14,
BIN4(115,1)=    1.05,    0.968,    0.898,    0.837,    0.783,    0.461,
BIN4(121,1)=   0.317,    0.237,    0.187,    0.153,    0.128,    0.110,
BIN4(127,1)=   0.096,    0.085,    0.076,    0.068,    0.062,    0.057,
BIN4(133,1)=   0.052,    0.048,    0.045,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                             **
/COM, **    Assembly Type:          STx                              **
/COM, **    Decay Period (years):   900000                           **
/COM, **    Number of assemblies:   1757                             **
/COM, **    Assemblies/pkg:         12                               **
/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  0.00                             **
/COM, **    Max Kinf:               1.130                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                19.450                           **
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/COM, **    Ave Burnup:              40410.796                          **
/COM, **    Ave Enrichment:          3.582                              **
/COM, **    Ave MTU/assy:            0.539                              **
/COM, **                                                                **
/COM, ************************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   698.81,   698.65,   698.50,   698.34,   698.18,   698.03,
BIN5( 7,1)=   697.87,   697.72,   697.56,   697.40,   697.25,   696.48,
BIN5(13,1)=   695.70,   694.94,   694.17,   693.41,   692.65,   691.89,
BIN5(19,1)=   691.14,   690.39,   689.64,   688.90,   688.15,   687.42,
BIN5(25,1)=   686.68,   685.95,   685.21,   684.49,   683.76,   676.64,
BIN5(31,1)=   669.78,   662.92,   656.30,   649.74,   643.40,   637.07,
BIN5(37,1)=   630.94,   624.77,   618.79,   612.91,   607.20,   601.51,
BIN5(43,1)=   595.98,   590.52,   585.21,   579.95,   574.84,   526.35,
BIN5(49,1)=   483.78,   446.29,   413.30,   383.59,   357.17,   333.68,
BIN5(55,1)=   312.62,   293.70,   276.69,   261.36,   247.52,   235.02,
BIN5(61,1)=   223.92,   213.87,   204.44,   195.96,   188.22,   138.96,
BIN5(67,1)=   113.90,    98.60,    88.11,    79.75,    73.11,    67.72,
BIN5(73,1)=    63.00,    58.70,    55.01,    51.82,    48.89,    46.10,
BIN5(79,1)=    43.64,    41.44,    39.47,    37.69,    36.00,    24.36,
BIN5(85,1)=    18.95,    16.13,    14.61,    13.72,    12.99,    12.51,
BIN5(91,1)=    12.10,    11.60,    11.17,    10.79,    10.44,    10.09,
BIN5(97,1)=     9.77,     9.47,     9.21,     8.96,     8.73,     6.38,
BIN5(103,1)=     5.11,     4.00,     3.28,     2.77,     2.39,     2.10,
BIN5(109,1)=     1.87,     1.66,     1.48,     1.33,     1.21,     1.10,
BIN5(115,1)=     1.02,    0.939,    0.872,    0.812,    0.760,    0.449,
BIN5(121,1)=    0.309,    0.231,    0.183,    0.150,    0.126,    0.108,
BIN5(127,1)=    0.094,    0.083,    0.074,    0.067,    0.061,    0.056,
BIN5(133,1)=    0.051,    0.048,    0.044,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:           BWR                                **
/COM, **    Decay Period (years):    900000                             **
/COM, **    Number of assemblies:    30085                              **
/COM, **    Assemblies/pkg:          44                                 **
/COM, **    Max Heat (Watts/assy):   400.00                             **
/COM, **    Min Heat (Watts/assy):   0.00                               **
/COM, **    Max Kinf:                1.000                              **
/COM, **    Min Kinf:                0.000                              **
/COM, **    Ave Age:                 18.284                             **
/COM, **    Ave Burnup:              41772.546                          **
/COM, **    Ave Enrichment:          3.284                              **
/COM, **    Ave MTU/assy:            0.174                              **
/COM, **                                                                **
/COM, ************************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   255.99,   255.92,   255.85,   255.78,   255.70,   255.63,
BIN6( 7,1)=   255.56,   255.49,   255.42,   255.35,   255.28,   254.93,
BIN6(13,1)=   254.57,   254.22,   253.88,   253.53,   253.19,   252.85,
BIN6(19,1)=   252.50,   252.17,   251.83,   251.49,   251.16,   250.83,
BIN6(25,1)=   250.50,   250.17,   249.84,   249.51,   249.19,   246.05,
BIN6(31,1)=   243.05,   240.16,   237.40,   234.73,   232.16,   229.65,
BIN6(37,1)=   227.22,   224.80,   222.45,   220.17,   217.97,   215.79,
BIN6(43,1)=   213.69,   211.60,   209.58,   207.59,   205.66,   187.63,
BIN6(49,1)=   172.04,   158.34,   146.29,   135.63,   126.15,   117.66,
BIN6(55,1)=   110.13,   103.39,    97.34,    91.89,    86.99,    82.56,
BIN6(61,1)=    78.57,    75.02,    71.77,    68.74,    66.02,    48.67,
BIN6(67,1)=    39.89,    34.48,    30.79,    27.85,    25.51,    23.61,
BIN6(73,1)=    21.95,    20.44,    19.15,    18.03,    17.00,    16.03,
BIN6(79,1)=    15.16,    14.40,    13.71,    13.08,    12.49,     8.42,
BIN6(85,1)=     6.53,     5.55,     5.02,     4.71,     4.46,     4.29,
BIN6(91,1)=     4.15,     3.98,     3.83,     3.69,     3.57,     3.45,
BIN6(97,1)=     3.34,     3.24,     3.15,     3.06,     2.98,     2.17,
BIN6(103,1)=     1.74,     1.36,     1.11,    0.936,    0.808,    0.710,
BIN6(109,1)=    0.632,    0.558,    0.498,    0.448,    0.407,    0.372,
BIN6(115,1)=    0.342,    0.316,    0.293,    0.273,    0.256,    0.151,
BIN6(121,1)=    0.104,    0.078,    0.061,    0.050,    0.042,    0.036,
BIN6(127,1)=    0.032,    0.028,    0.025,    0.022,    0.020,    0.019,
BIN6(133,1)=    0.017,    0.016,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                   **
/COM, **    Assembly Type:            BWR                                  **
/COM, **    Decay Period (years):     900000                               **
/COM, **    Number of assemblies:     93749                                **
/COM, **    Assemblies/pkg:           44                                   **
/COM, **    Max Heat (Watts/assy):    400.00                               **
/COM, **    Min Heat (Watts/assy):    0.00                                 **
/COM, **    Max Kinf:                 1.370                                **
/COM, **    Min Kinf:                 1.000                                **
/COM, **    Ave Age:                  29.375                               **
/COM, **    Ave Burnup:               29338.962                            **
/COM, **    Ave Enrichment:           2.915                                **
/COM, **    Ave MTU/assy:             0.178                                **
/COM, **                                                                   **
/COM, ***********************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   148.21,   148.18,   148.14,   148.11,   148.07,   148.03,
BIN7( 7,1)=   148.00,   147.96,   147.93,   147.89,   147.85,   147.67,
BIN7(13,1)=   147.49,   147.32,   147.14,   146.96,   146.79,   146.61,
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BIN7(19,1)=   146.44,   146.26,   146.09,   145.92,   145.75,   145.58,
BIN7(25,1)=   145.41,   145.24,   145.07,   144.90,   144.74,   143.13,
BIN7(31,1)=   141.58,   140.10,   138.66,   137.28,   135.93,   134.62,
BIN7(37,1)=   133.35,   132.08,   130.85,   129.65,   128.49,   127.33,
BIN7(43,1)=   126.21,   125.11,   124.04,   122.97,   121.94,   112.24,
BIN7(49,1)=   103.78,    96.25,    89.58,    83.63,    78.30,    73.50,
BIN7(55,1)=    69.22,    65.38,    61.92,    58.80,    55.96,    53.40,
BIN7(61,1)=    51.09,    49.00,    47.11,    45.35,    43.76,    33.58,
BIN7(67,1)=    28.31,    25.05,    22.67,    20.77,    19.19,    17.87,
BIN7(73,1)=    16.66,    15.56,    14.62,    13.79,    13.01,    12.26,
BIN7(79,1)=    11.61,    11.02,    10.50,    10.02,     9.56,     6.42,
BIN7(85,1)=     4.96,     4.21,     3.81,     3.58,     3.39,     3.27,
BIN7(91,1)=     3.16,     3.03,     2.93,     2.83,     2.74,     2.65,
BIN7(97,1)=     2.57,     2.50,     2.43,     2.36,     2.30,     1.71,
BIN7(103,1)=     1.38,     1.08,    0.887,    0.750,    0.649,    0.571,
BIN7(109,1)=    0.509,    0.446,    0.395,    0.353,    0.318,    0.289,
BIN7(115,1)=    0.264,    0.243,    0.224,    0.208,    0.194,    0.110,
BIN7(121,1)=    0.074,    0.054,    0.042,    0.034,    0.028,    0.024,
BIN7(127,1)=    0.021,    0.018,    0.016,    0.015,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:            BWR                              **
/COM, **    Decay Period (years):     900000                           **
/COM, **    Number of assemblies:     1250                             **
/COM, **    Assemblies/pkg:           24                               **
/COM, **    Max Heat (Watts/assy):    520.00                           **
/COM, **    Min Heat (Watts/assy):    0.00                             **
/COM, **    Max Kinf:                 1.540                            **
/COM, **    Min Kinf:                 0.000                            **
/COM, **    Ave Age:                  15.734                           **
/COM, **    Ave Burnup:               10301.713                        **
/COM, **    Ave Enrichment:           3.612                            **
/COM, **    Ave MTU/assy:             0.166                            **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    48.84,    48.82,    48.81,    48.79,    48.78,    48.76,
BIN8( 7,1)=    48.75,    48.74,    48.72,    48.71,    48.69,    48.62,
BIN8(13,1)=    48.55,    48.47,    48.40,    48.33,    48.26,    48.19,
BIN8(19,1)=    48.12,    48.05,    47.98,    47.91,    47.84,    47.78,
BIN8(25,1)=    47.71,    47.64,    47.57,    47.51,    47.44,    46.80,
BIN8(31,1)=    46.20,    45.61,    45.05,    44.52,    44.01,    43.49,
BIN8(37,1)=    43.00,    42.51,    42.05,    41.59,    41.15,    40.71,
BIN8(43,1)=    40.29,    39.87,    39.46,    39.04,    38.63,    35.02,
```

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BIN8(49,1)=    31.87,    29.10,    26.66,    24.48,    22.56,    20.84,
BIN8(55,1)=    19.31,    17.93,    16.71,    15.62,    14.64,    13.77,
BIN8(61,1)=    13.00,    12.30,    11.68,    11.12,    10.61,     7.72,
BIN8(67,1)=     6.50,     5.86,     5.43,     5.09,     4.80,     4.54,
BIN8(73,1)=     4.31,     4.08,     3.88,     3.71,     3.55,     3.39,
BIN8(79,1)=     3.25,     3.12,     3.01,     2.90,     2.80,     2.11,
BIN8(85,1)=     1.79,     1.62,     1.53,     1.47,     1.41,     1.37,
BIN8(91,1)=     1.34,     1.30,     1.26,     1.23,     1.20,     1.17,
BIN8(97,1)=     1.14,     1.11,     1.09,     1.06,     1.04,    0.817,
BIN8(103,1)=    0.687,    0.552,    0.461,    0.397,    0.348,    0.310,
BIN8(109,1)=    0.279,    0.242,    0.213,    0.189,    0.170,    0.153,
BIN8(115,1)=    0.139,    0.127,    0.117,    0.108,    0.100,    0.055,
BIN8(121,1)=    0.036,    0.026,    0.020,    0.016,    0.013,    0.011,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.006,    0.005,
BIN8(133,1)=    0.005,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case7.wsm                          **
/COM, **    Output File Name:       finalw7.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   38290                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                21.706                             **
/COM, **    Ave Burnup:             45820.620                          **
/COM, **    Ave Enrichment:         3.842                              **
/COM, **    Ave MTU/assy:           0.430                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   565.13,   565.00,   564.87,   564.74,   564.61,   564.48,
BIN1( 7,1)=   564.36,   564.23,   564.10,   563.97,   563.85,   563.21,
BIN1(13,1)=   562.58,   561.95,   561.32,   560.69,   560.07,   559.45,
BIN1(19,1)=   558.83,   558.21,   557.59,   556.98,   556.37,   555.77,
BIN1(25,1)=   555.16,   554.56,   553.96,   553.36,   552.76,   546.87,
BIN1(31,1)=   541.19,   535.60,   530.20,   524.86,   519.69,   514.56,
BIN1(37,1)=   509.59,   504.66,   499.86,   495.13,   490.54,   485.96,
BIN1(43,1)=   481.50,   477.06,   472.75,   468.45,   464.26,   425.29,
BIN1(49,1)=   391.08,   360.90,   334.12,   310.27,   288.97,   269.94,
BIN1(55,1)=   252.89,   237.56,   223.77,   211.34,   200.14,   190.07,
BIN1(61,1)=   180.97,   172.74,   165.18,   158.30,   152.04,   112.42,
BIN1(67,1)=    92.39,    80.35,    72.03,    65.47,    60.24,    55.96,
BIN1(73,1)=    52.18,    48.75,    45.80,    43.24,    40.87,    38.64,
BIN1(79,1)=    36.66,    34.89,    33.30,    31.86,    30.48,    21.05,
BIN1(85,1)=    16.64,    14.31,    13.04,    12.27,    11.64,    11.22,
BIN1(91,1)=    10.85,    10.41,    10.02,     9.68,     9.37,     9.05,
BIN1(97,1)=     8.76,     8.49,     8.25,     8.03,     7.82,     5.71,
BIN1(103,1)=     4.57,     3.57,     2.92,     2.46,     2.12,     1.86,
BIN1(109,1)=     1.65,     1.45,     1.29,     1.16,     1.05,    0.954,
BIN1(115,1)=    0.874,    0.805,    0.744,    0.692,    0.645,    0.372,
BIN1(121,1)=    0.252,    0.186,    0.145,    0.118,    0.098,    0.084,
BIN1(127,1)=    0.073,    0.064,    0.057,    0.051,    0.046,    0.042,
BIN1(133,1)=    0.038,    0.035,    0.033,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
```

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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     50617                             **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.130                             **
/COM, **    Min Kinf:                 1.000                             **
/COM, **    Ave Age:                  24.763                            **
/COM, **    Ave Burnup:               36377.288                         **
/COM, **    Ave Enrichment:           3.665                             **
/COM, **    Ave MTU/assy:             0.430                             **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   419.25,   419.15,   419.05,   418.95,   418.85,   418.75,
BIN2( 7,1)=   418.65,   418.55,   418.45,   418.35,   418.25,   417.76,
BIN2(13,1)=   417.26,   416.77,   416.28,   415.79,   415.31,   414.82,
BIN2(19,1)=   414.34,   413.86,   413.39,   412.91,   412.44,   411.97,
BIN2(25,1)=   411.50,   411.03,   410.57,   410.10,   409.64,   405.16,
BIN2(31,1)=   400.85,   396.66,   392.62,   388.67,   384.85,   381.11,
BIN2(37,1)=   377.48,   373.84,   370.31,   366.87,   363.52,   360.21,
BIN2(43,1)=   356.99,   353.78,   350.65,   347.57,   344.58,   316.36,
BIN2(49,1)=   291.69,   269.71,   250.21,   232.75,   217.14,   203.08,
BIN2(55,1)=   190.49,   179.15,   168.94,   159.74,   151.44,   143.94,
BIN2(61,1)=   137.18,   131.06,   125.50,   120.39,   115.76,    86.72,
BIN2(67,1)=    72.25,    63.61,    57.55,    52.71,    48.76,    45.47,
BIN2(73,1)=    42.49,    39.75,    37.39,    35.34,    33.41,    31.58,
BIN2(79,1)=    29.95,    28.50,    27.19,    26.01,    24.87,    17.08,
BIN2(85,1)=    13.43,    11.52,    10.50,     9.88,     9.39,     9.05,
BIN2(91,1)=     8.76,     8.42,     8.12,     7.85,     7.61,     7.36,
BIN2(97,1)=     7.13,     6.92,     6.73,     6.56,     6.39,     4.73,
BIN2(103,1)=    3.82,     3.00,     2.46,     2.08,     1.80,     1.58,
BIN2(109,1)=    1.41,     1.23,     1.09,    0.973,    0.876,    0.795,
BIN2(115,1)=   0.726,    0.666,    0.615,    0.570,    0.530,    0.299,
BIN2(121,1)=   0.199,    0.146,    0.113,    0.091,    0.075,    0.064,
BIN2(127,1)=   0.055,    0.048,    0.042,    0.038,    0.034,    0.031,
BIN2(133,1)=   0.028,    0.026,    0.024,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     3043                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  28.679                            **
/COM, **    Ave Burnup:               17933.069                         **
/COM, **    Ave Enrichment:           3.597                             **
/COM, **    Ave MTU/assy:             0.396                             **
/COM, **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   168.82,   168.78,   168.74,   168.69,   168.65,   168.61,
BIN3( 7,1)=   168.57,   168.52,   168.48,   168.44,   168.39,   168.18,
BIN3(13,1)=   167.97,   167.76,   167.55,   167.34,   167.14,   166.93,
BIN3(19,1)=   166.73,   166.52,   166.32,   166.12,   165.91,   165.71,
BIN3(25,1)=   165.52,   165.32,   165.12,   164.92,   164.73,   162.81,
BIN3(31,1)=   160.97,   159.21,   157.52,   155.87,   154.28,   152.71,
BIN3(37,1)=   151.18,   149.66,   148.20,   146.76,   145.36,   143.98,
BIN3(43,1)=   142.64,   141.32,   140.04,   138.74,   137.47,   125.77,
BIN3(49,1)=   115.52,   106.37,    98.23,    90.97,    84.48,    78.63,
BIN3(55,1)=    73.41,    68.73,    64.54,    60.77,    57.38,    54.34,
BIN3(61,1)=    51.61,    49.15,    46.95,    44.94,    43.15,    32.35,
BIN3(67,1)=    27.41,    24.68,    22.76,    21.21,    19.89,    18.76,
BIN3(73,1)=    17.68,    16.68,    15.81,    15.05,    14.31,    13.61,
BIN3(79,1)=    12.99,    12.42,    11.91,    11.45,    11.00,     7.94,
BIN3(85,1)=     6.51,     5.74,     5.32,     5.06,     4.85,     4.70,
BIN3(91,1)=     4.56,     4.41,     4.27,     4.15,     4.04,     3.92,
BIN3(97,1)=     3.81,     3.72,     3.63,     3.54,     3.47,     2.66,
BIN3(103,1)=     2.20,     1.75,     1.46,     1.24,     1.08,    0.961,
BIN3(109,1)=    0.863,    0.749,    0.659,    0.585,    0.524,    0.474,
BIN3(115,1)=    0.430,    0.394,    0.362,    0.334,    0.310,    0.170,
BIN3(121,1)=    0.111,    0.080,    0.061,    0.049,    0.040,    0.034,
BIN3(127,1)=    0.029,    0.025,    0.022,    0.020,    0.018,    0.016,
BIN3(133,1)=    0.014,    0.013,    0.012,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     942                               **
/COM, **    Assemblies/pkg:           12                                **
```

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/COM, **    Max Heat (Watts/assy):  1500.00                                **
/COM, **    Min Heat (Watts/assy):  850.00                                 **
/COM, **    Max Kinf:               1.020                                  **
/COM, **    Min Kinf:               0.000                                  **
/COM, **    Ave Age:                11.655                                 **
/COM, **    Ave Burnup:             54153.206                              **
/COM, **    Ave Enrichment:         4.362                                  **
/COM, **    Ave MTU/assy:           0.452                                  **
/COM, **
/COM, ***********************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   912.58,   912.23,   911.88,   911.54,   911.19,   910.85,
BIN4( 7,1)=   910.50,   910.16,   909.81,   909.47,   909.13,   907.42,
BIN4(13,1)=   905.72,   904.04,   902.36,   900.70,   899.04,   897.40,
BIN4(19,1)=   895.76,   894.14,   892.53,   890.92,   889.33,   887.74,
BIN4(25,1)=   886.17,   884.60,   883.05,   881.50,   879.96,   865.78,
BIN4(31,1)=   852.36,   839.84,   827.93,   816.60,   805.78,   795.47,
BIN4(37,1)=   785.60,   775.57,   765.96,   757.17,   748.71,   740.46,
BIN4(43,1)=   732.51,   724.63,   717.03,   709.63,   702.47,   634.93,
BIN4(49,1)=   578.56,   528.69,   485.24,   446.89,   413.23,   382.62,
BIN4(55,1)=   355.75,   331.71,   310.15,   290.81,   273.41,   257.75,
BIN4(61,1)=   243.61,   230.89,   219.82,   209.10,   199.59,   139.99,
BIN4(67,1)=   111.55,    94.88,    84.05,    75.68,    69.13,    63.97,
BIN4(73,1)=    59.57,    55.59,    52.18,    49.22,    46.58,    44.10,
BIN4(79,1)=    41.89,    39.92,    38.14,    36.54,    35.04,    24.61,
BIN4(85,1)=    19.73,    17.11,    15.65,    14.74,    14.00,    13.48,
BIN4(91,1)=    13.03,    12.48,    12.01,    11.58,    11.20,    10.81,
BIN4(97,1)=    10.45,    10.12,     9.83,     9.55,     9.30,     6.72,
BIN4(103,1)=    5.34,     4.16,     3.39,     2.85,     2.45,     2.15,
BIN4(109,1)=    1.91,     1.68,     1.50,     1.35,     1.23,     1.12,
BIN4(115,1)=    1.03,    0.954,    0.886,    0.825,    0.772,    0.455,
BIN4(121,1)=   0.313,    0.234,    0.184,    0.151,    0.127,    0.109,
BIN4(127,1)=   0.095,    0.084,    0.075,    0.067,    0.061,    0.056,
BIN4(133,1)=   0.051,    0.047,    0.044,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                    **
/COM, **    Assembly Type:          STx                                     **
/COM, **    Decay Period (years):   900000                                  **
/COM, **    Number of assemblies:   1793                                    **
/COM, **    Assemblies/pkg:         12                                      **
/COM, **    Max Heat (Watts/assy):  1500.00                                 **
/COM, **    Min Heat (Watts/assy):  0.00                                    **
/COM, **    Max Kinf:               1.130                                   **
/COM, **    Min Kinf:               0.000                                   **
/COM, **    Ave Age:                26.360                                  **
```

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/COM, **    Ave Burnup:            39860.439                    **
/COM, **    Ave Enrichment:        3.552                        **
/COM, **    Ave MTU/assy:          0.539                        **
/COM, **                                                        **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   591.23,   591.12,   591.01,   590.90,   590.79,   590.68,
BIN5( 7,1)=   590.57,   590.46,   590.35,   590.24,   590.13,   589.58,
BIN5(13,1)=   589.04,   588.49,   587.95,   587.41,   586.87,   586.33,
BIN5(19,1)=   585.79,   585.26,   584.72,   584.19,   583.66,   583.13,
BIN5(25,1)=   582.60,   582.08,   581.55,   581.03,   580.50,   575.23,
BIN5(31,1)=   570.10,   565.05,   560.14,   555.14,   550.28,   545.34,
BIN5(37,1)=   540.52,   535.77,   531.13,   526.55,   522.08,   517.53,
BIN5(43,1)=   513.09,   508.69,   504.39,   500.12,   495.96,   456.91,
BIN5(49,1)=   422.28,   391.66,   364.12,   339.73,   317.89,   298.28,
BIN5(55,1)=   280.65,   264.78,   250.47,   237.54,   225.85,   215.64,
BIN5(61,1)=   205.97,   197.23,   189.26,   181.99,   175.33,   132.52,
BIN5(67,1)=   109.72,    95.68,    85.69,    77.74,    71.42,    66.24,
BIN5(73,1)=    61.62,    57.47,    53.90,    50.81,    47.92,    45.22,
BIN5(79,1)=    42.83,    40.69,    38.77,    37.03,    35.36,    24.00,
BIN5(85,1)=    18.70,    15.94,    14.45,    13.56,    12.85,    12.38,
BIN5(91,1)=    11.96,    11.48,    11.05,    10.67,    10.33,     9.98,
BIN5(97,1)=     9.66,     9.38,     9.11,     8.87,     8.64,     6.32,
BIN5(103,1)=     5.07,     3.97,     3.25,     2.75,     2.37,     2.09,
BIN5(109,1)=     1.86,     1.64,     1.46,     1.32,     1.20,     1.09,
BIN5(115,1)=     1.01,    0.929,    0.863,    0.804,    0.752,    0.444,
BIN5(121,1)=    0.305,    0.228,    0.180,    0.148,    0.124,    0.107,
BIN5(127,1)=    0.093,    0.082,    0.073,    0.066,    0.060,    0.055,
BIN5(133,1)=    0.051,    0.047,    0.043,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                        **
/COM, **    Assembly Type:         BWR                          **
/COM, **    Decay Period (years):  900000                       **
/COM, **    Number of assemblies:  33968                        **
/COM, **    Assemblies/pkg:        44                           **
/COM, **    Max Heat (Watts/assy): 400.00                       **
/COM, **    Min Heat (Watts/assy): 0.00                         **
/COM, **    Max Kinf:              1.000                        **
/COM, **    Min Kinf:              0.000                        **
/COM, **    Ave Age:               18.875                       **
/COM, **    Ave Burnup:            43073.142                    **
/COM, **    Ave Enrichment:        3.357                        **
/COM, **    Ave MTU/assy:          0.174                        **
/COM, **                                                        **
/COM, ******************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   254.95,   254.88,   254.81,   254.75,   254.68,   254.62,
BIN6( 7,1)=   254.55,   254.48,   254.42,   254.35,   254.29,   253.96,
BIN6(13,1)=   253.63,   253.31,   252.98,   252.66,   252.34,   252.02,
BIN6(19,1)=   251.71,   251.39,   251.07,   250.76,   250.45,   250.14,
BIN6(25,1)=   249.83,   249.52,   249.22,   248.91,   248.61,   245.65,
BIN6(31,1)=   242.82,   240.07,   237.42,   234.84,   232.35,   229.91,
BIN6(37,1)=   227.54,   225.21,   222.94,   220.72,   218.57,   216.43,
BIN6(43,1)=   214.35,   212.29,   210.29,   208.30,   206.36,   188.47,
BIN6(49,1)=   172.94,   159.31,   147.25,   136.60,   127.11,   118.65,
BIN6(55,1)=   111.11,   104.35,    98.28,    92.82,    87.90,    83.50,
BIN6(61,1)=    79.50,    75.90,    72.63,    69.61,    66.87,    49.38,
BIN6(67,1)=    40.46,    34.96,    31.19,    28.19,    25.82,    23.89,
BIN6(73,1)=    22.21,    20.68,    19.37,    18.24,    17.20,    16.22,
BIN6(79,1)=    15.35,    14.58,    13.88,    13.25,    12.65,     8.55,
BIN6(85,1)=     6.64,     5.65,     5.11,     4.80,     4.54,     4.37,
BIN6(91,1)=     4.22,     4.05,     3.90,     3.76,     3.64,     3.51,
BIN6(97,1)=     3.40,     3.30,     3.20,     3.12,     3.03,     2.21,
BIN6(103,1)=     1.76,     1.38,     1.13,    0.951,    0.821,    0.720,
BIN6(109,1)=    0.641,    0.567,    0.506,    0.456,    0.415,    0.379,
BIN6(115,1)=    0.349,    0.322,    0.299,    0.279,    0.261,    0.155,
BIN6(121,1)=    0.107,    0.080,    0.063,    0.052,    0.044,    0.037,
BIN6(127,1)=    0.033,    0.029,    0.026,    0.023,    0.021,    0.019,
BIN6(133,1)=    0.018,    0.016,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:            BWR                             **
/COM, **    Decay Period (years):     900000                          **
/COM, **    Number of assemblies:     89742                           **
/COM, **    Assemblies/pkg:           44                              **
/COM, **    Max Heat (Watts/assy):    400.00                          **
/COM, **    Min Heat (Watts/assy):    0.00                            **
/COM, **    Max Kinf:                 1.370                           **
/COM, **    Min Kinf:                 1.000                           **
/COM, **    Ave Age:                  24.666                          **
/COM, **    Ave Burnup:               29387.381                       **
/COM, **    Ave Enrichment:           2.976                           **
/COM, **    Ave MTU/assy:             0.178                           **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   155.25,   155.22,   155.18,   155.14,   155.11,   155.07,
BIN7( 7,1)=   155.04,   155.00,   154.96,   154.93,   154.89,   154.71,
BIN7(13,1)=   154.53,   154.36,   154.18,   154.00,   153.83,   153.65,
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BIN7(19,1)=   153.48,   153.30,   153.13,   152.96,   152.79,   152.62,
BIN7(25,1)=   152.45,   152.28,   152.11,   151.94,   151.78,   150.15,
BIN7(31,1)=   148.58,   147.06,   145.59,   144.14,   142.75,   141.37,
BIN7(37,1)=   140.05,   138.72,   137.43,   136.17,   134.95,   133.73,
BIN7(43,1)=   132.55,   131.38,   130.24,   129.10,   128.00,   117.68,
BIN7(49,1)=   108.64,   100.61,    93.49,    87.12,    81.43,    76.33,
BIN7(55,1)=    71.76,    67.64,    63.94,    60.60,    57.59,    54.87,
BIN7(61,1)=    52.43,    50.21,    48.18,    46.32,    44.63,    33.92,
BIN7(67,1)=    28.45,    25.08,    22.68,    20.75,    19.16,    17.83,
BIN7(73,1)=    16.63,    15.53,    14.58,    13.75,    12.98,    12.23,
BIN7(79,1)=    11.58,    10.99,    10.47,     9.99,     9.53,     6.41,
BIN7(85,1)=     4.95,     4.20,     3.80,     3.57,     3.38,     3.26,
BIN7(91,1)=     3.15,     3.03,     2.92,     2.82,     2.74,     2.65,
BIN7(97,1)=     2.57,     2.49,     2.42,     2.36,     2.30,     1.70,
BIN7(103,1)=     1.38,     1.08,    0.886,    0.749,    0.648,    0.571,
BIN7(109,1)=    0.509,    0.446,    0.395,    0.353,    0.319,    0.290,
BIN7(115,1)=    0.265,    0.244,    0.225,    0.209,    0.194,    0.111,
BIN7(121,1)=    0.074,    0.055,    0.043,    0.034,    0.029,    0.024,
BIN7(127,1)=    0.021,    0.018,    0.016,    0.015,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                    **
/COM, **    Assembly Type:            BWR                                   **
/COM, **    Decay Period (years):     900000                                **
/COM, **    Number of assemblies:     1610                                  **
/COM, **    Assemblies/pkg:           24                                    **
/COM, **    Max Heat (Watts/assy):    520.00                                **
/COM, **    Min Heat (Watts/assy):    0.00                                  **
/COM, **    Max Kinf:                 1.540                                 **
/COM, **    Min Kinf:                 0.000                                 **
/COM, **    Ave Age:                  17.679                                **
/COM, **    Ave Burnup:               9685.796                              **
/COM, **    Ave Enrichment:           3.569                                 **
/COM, **    Ave MTU/assy:             0.168                                 **
/COM, **.
/COM, ***********************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    42.69,    42.68,    42.67,    42.66,    42.65,    42.64,
BIN8( 7,1)=    42.63,    42.62,    42.61,    42.60,    42.59,    42.53,
BIN8(13,1)=    42.48,    42.42,    42.37,    42.32,    42.26,    42.21,
BIN8(19,1)=    42.16,    42.11,    42.05,    42.00,    41.95,    41.90,
BIN8(25,1)=    41.85,    41.80,    41.75,    41.70,    41.65,    41.17,
BIN8(31,1)=    40.70,    40.24,    39.80,    39.35,    38.93,    38.51,
BIN8(37,1)=    38.10,    37.70,    37.31,    36.92,    36.55,    36.18,
BIN8(43,1)=    35.82,    35.45,    35.10,    34.75,    34.41,    31.26,
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BIN8(49,1)=    28.48,    26.05,    23.90,    21.98,    20.28,    18.76,
BIN8(55,1)=    17.40,    16.20,    15.12,    14.15,    13.29,    12.53,
BIN8(61,1)=    11.84,    11.23,    10.68,    10.19,     9.74,     7.19,
BIN8(67,1)=     6.09,     5.51,     5.12,     4.80,     4.53,     4.29,
BIN8(73,1)=     4.08,     3.86,     3.68,     3.52,     3.37,     3.22,
BIN8(79,1)=     3.09,     2.97,     2.87,     2.77,     2.68,     2.03,
BIN8(85,1)=     1.74,     1.58,     1.49,     1.43,     1.38,     1.34,
BIN8(91,1)=     1.31,     1.27,     1.23,     1.20,     1.17,     1.14,
BIN8(97,1)=     1.11,     1.09,     1.06,     1.04,     1.02,    0.803,
BIN8(103,1)=    0.677,    0.544,    0.455,    0.391,    0.343,    0.306,
BIN8(109,1)=    0.276,    0.239,    0.210,    0.187,    0.167,    0.151,
BIN8(115,1)=    0.137,    0.125,    0.115,    0.106,    0.099,    0.054,
BIN8(121,1)=    0.035,    0.025,    0.019,    0.015,    0.013,    0.011,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.005,    0.005,
BIN8(133,1)=    0.004,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case8.wsm                          **
/COM, **    Output File Name:       finalw8.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   38305                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                21.712                             **
/COM, **    Ave Burnup:             45829.250                          **
/COM, **    Ave Enrichment:         3.843                              **
/COM, **    Ave MTU/assy:           0.430                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   565.20,   565.07,   564.94,   564.81,   564.68,   564.55,
BIN1( 7,1)=   564.43,   564.30,   564.17,   564.05,   563.92,   563.28,
BIN1(13,1)=   562.65,   562.02,   561.39,   560.76,   560.14,   559.52,
BIN1(19,1)=   558.90,   558.28,   557.66,   557.05,   556.44,   555.84,
BIN1(25,1)=   555.23,   554.63,   554.03,   553.43,   552.83,   546.94,
BIN1(31,1)=   541.26,   535.67,   530.27,   524.93,   519.75,   514.63,
BIN1(37,1)=   509.66,   504.72,   499.93,   495.20,   490.60,   486.02,
BIN1(43,1)=   481.57,   477.13,   472.81,   468.51,   464.33,   425.34,
BIN1(49,1)=   391.13,   360.94,   334.16,   310.31,   289.00,   269.98,
BIN1(55,1)=   252.92,   237.59,   223.79,   211.36,   200.16,   190.09,
BIN1(61,1)=   181.00,   172.76,   165.20,   158.32,   152.06,   112.43,
BIN1(67,1)=    92.40,    80.35,    72.04,    65.47,    60.24,    55.97,
BIN1(73,1)=    52.19,    48.75,    45.80,    43.24,    40.87,    38.64,
BIN1(79,1)=    36.66,    34.89,    33.30,    31.86,    30.49,    21.06,
BIN1(85,1)=    16.64,    14.31,    13.04,    12.27,    11.65,    11.22,
BIN1(91,1)=    10.85,    10.41,    10.02,     9.68,     9.37,     9.05,
BIN1(97,1)=     8.76,     8.49,     8.25,     8.03,     7.82,     5.71,
BIN1(103,1)=     4.57,     3.57,     2.92,     2.46,     2.12,     1.86,
BIN1(109,1)=     1.66,     1.45,     1.29,     1.16,     1.05,    0.954,
BIN1(115,1)=    0.874,    0.805,    0.745,    0.692,    0.645,    0.372,
BIN1(121,1)=    0.252,    0.186,    0.145,    0.118,    0.098,    0.084,
BIN1(127,1)=    0.073,    0.064,    0.057,    0.051,    0.046,    0.042,
BIN1(133,1)=    0.038,    0.035,    0.033,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     50578                             **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.130                             **
/COM, **    Min Kinf:                 1.000                             **
/COM, **    Ave Age:                  24.764                            **
/COM, **    Ave Burnup:               36380.228                         **
/COM, **    Ave Enrichment:           3.665                             **
/COM, **    Ave MTU/assy:             0.430                             **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   419.29,   419.19,   419.09,   418.99,   418.89,   418.79,
BIN2( 7,1)=   418.69,   418.59,   418.49,   418.39,   418.30,   417.80,
BIN2(13,1)=   417.30,   416.81,   416.32,   415.84,   415.35,   414.87,
BIN2(19,1)=   414.38,   413.91,   413.43,   412.95,   412.48,   412.01,
BIN2(25,1)=   411.54,   411.07,   410.61,   410.14,   409.68,   405.20,
BIN2(31,1)=   400.89,   396.70,   392.66,   388.71,   384.89,   381.14,
BIN2(37,1)=   377.51,   373.88,   370.35,   366.90,   363.55,   360.24,
BIN2(43,1)=   357.02,   353.81,   350.68,   347.61,   344.61,   316.39,
BIN2(49,1)=   291.72,   269.74,   250.23,   232.78,   217.17,   203.10,
BIN2(55,1)=   190.51,   179.17,   168.96,   159.76,   151.46,   143.96,
BIN2(61,1)=   137.20,   131.08,   125.52,   120.41,   115.78,    86.73,
BIN2(67,1)=    72.26,    63.62,    57.56,    52.72,    48.77,    45.48,
BIN2(73,1)=    42.49,    39.75,    37.40,    35.35,    33.41,    31.58,
BIN2(79,1)=    29.96,    28.50,    27.20,    26.01,    24.87,    17.08,
BIN2(85,1)=    13.43,    11.53,    10.50,     9.89,     9.39,     9.05,
BIN2(91,1)=     8.76,     8.42,     8.12,     7.85,     7.61,     7.36,
BIN2(97,1)=     7.13,     6.92,     6.73,     6.56,     6.39,     4.73,
BIN2(103,1)=    3.82,     3.00,     2.46,     2.08,     1.80,     1.58,
BIN2(109,1)=    1.41,     1.23,     1.09,    0.973,    0.876,    0.795,
BIN2(115,1)=   0.726,    0.666,    0.615,    0.570,    0.530,    0.299,
BIN2(121,1)=   0.199,    0.146,    0.113,    0.091,    0.075,    0.064,
BIN2(127,1)=   0.055,    0.048,    0.043,    0.038,    0.034,    0.031,
BIN2(133,1)=   0.028,    0.026,    0.024,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
```

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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     3050                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  28.670                            **
/COM, **    Ave Burnup:               17951.578                         **
/COM, **    Ave Enrichment:           3.598                             **
/COM, **    Ave MTU/assy:             0.395                             **
/COM, **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   168.81,   168.77,   168.72,   168.68,   168.64,   168.60,
BIN3( 7,1)=   168.55,   168.51,   168.47,   168.43,   168.38,   168.17,
BIN3(13,1)=   167.96,   167.75,   167.54,   167.33,   167.12,   166.92,
BIN3(19,1)=   166.71,   166.51,   166.30,   166.10,   165.90,   165.70,
BIN3(25,1)=   165.50,   165.30,   165.10,   164.91,   164.71,   162.79,
BIN3(31,1)=   160.95,   159.19,   157.50,   155.85,   154.26,   152.68,
BIN3(37,1)=   151.16,   149.64,   148.17,   146.73,   145.34,   143.96,
BIN3(43,1)=   142.62,   141.30,   140.02,   138.71,   137.45,   125.75,
BIN3(49,1)=   115.50,   106.35,    98.22,    90.96,    84.46,    78.62,
BIN3(55,1)=    73.40,    68.72,    64.53,    60.76,    57.37,    54.33,
BIN3(61,1)=    51.60,    49.14,    46.95,    44.93,    43.14,    32.34,
BIN3(67,1)=    27.41,    24.67,    22.75,    21.20,    19.89,    18.75,
BIN3(73,1)=    17.68,    16.68,    15.81,    15.04,    14.31,    13.61,
BIN3(79,1)=    12.98,    12.42,    11.91,    11.45,    11.00,     7.94,
BIN3(85,1)=     6.50,     5.74,     5.32,     5.06,     4.85,     4.70,
BIN3(91,1)=     4.56,     4.41,     4.27,     4.15,     4.04,     3.92,
BIN3(97,1)=     3.81,     3.71,     3.62,     3.54,     3.46,     2.66,
BIN3(103,1)=     2.20,     1.75,     1.45,     1.24,     1.08,    0.960,
BIN3(109,1)=    0.862,    0.749,    0.658,    0.585,    0.524,    0.473,
BIN3(115,1)=    0.430,    0.393,    0.361,    0.334,    0.309,    0.170,
BIN3(121,1)=    0.111,    0.080,    0.061,    0.049,    0.040,    0.034,
BIN3(127,1)=    0.029,    0.025,    0.022,    0.020,    0.018,    0.016,
BIN3(133,1)=    0.014,    0.013,    0.012,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     935                               **
/COM, **    Assemblies/pkg:           12                                **
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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                11.660                           **
/COM, **    Ave Burnup:             54184.295                        **
/COM, **    Ave Enrichment:         4.365                            **
/COM, **    Ave MTU/assy:           0.451                            **
/COM, **                                                             **
/COM, ********************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   912.88,   912.53,   912.19,   911.84,   911.50,   911.15,
BIN4( 7,1)=   910.81,   910.46,   910.12,   909.77,   909.43,   907.72,
BIN4(13,1)=   906.03,   904.34,   902.66,   901.00,   899.34,   897.70,
BIN4(19,1)=   896.06,   894.44,   892.83,   891.22,   889.63,   888.04,
BIN4(25,1)=   886.46,   884.90,   883.34,   881.79,   880.26,   866.07,
BIN4(31,1)=   852.65,   840.12,   828.22,   816.87,   806.05,   795.74,
BIN4(37,1)=   785.88,   775.85,   766.23,   757.43,   748.97,   740.72,
BIN4(43,1)=   732.77,   724.88,   717.27,   709.87,   702.72,   635.15,
BIN4(49,1)=   578.75,   528.86,   485.40,   447.03,   413.36,   382.73,
BIN4(55,1)=   355.85,   331.80,   310.24,   290.89,   273.49,   257.82,
BIN4(61,1)=   243.68,   230.95,   219.87,   209.15,   199.64,   140.01,
BIN4(67,1)=   111.56,    94.88,    84.05,    75.68,    69.13,    63.96,
BIN4(73,1)=    59.56,    55.58,    52.17,    49.22,    46.58,    44.09,
BIN4(79,1)=    41.89,    39.92,    38.14,    36.54,    35.04,    24.61,
BIN4(85,1)=    19.73,    17.11,    15.65,    14.74,    14.00,    13.48,
BIN4(91,1)=    13.03,    12.49,    12.01,    11.59,    11.21,    10.81,
BIN4(97,1)=    10.45,    10.13,     9.83,     9.56,     9.30,     6.72,
BIN4(103,1)=    5.34,     4.16,     3.39,     2.85,     2.45,     2.15,
BIN4(109,1)=    1.91,     1.68,     1.50,     1.35,     1.23,     1.12,
BIN4(115,1)=    1.03,    0.955,    0.886,    0.826,    0.772,    0.455,
BIN4(121,1)=   0.313,    0.234,    0.184,    0.151,    0.127,    0.109,
BIN4(127,1)=   0.095,    0.084,    0.075,    0.067,    0.061,    0.056,
BIN4(133,1)=   0.051,    0.047,    0.044,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ********************************************************************
/COM, **                                                             **
/COM, **    Assembly Type:          STx                              **
/COM, **    Decay Period (years):   900000                           **
/COM, **    Number of assemblies:   1793                             **
/COM, **    Assemblies/pkg:         12                               **
/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  0.00                             **
/COM, **    Max Kinf:               1.130                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                26.360                           **
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/COM, **    Ave Burnup:              39860.439                          **
/COM, **    Ave Enrichment:          3.552                              **
/COM, **    Ave MTU/assy:            0.539                              **
/COM, **                                                                **
/COM, ************************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   591.23,   591.12,   591.01,   590.90,   590.79,   590.68,
BIN5( 7,1)=   590.57,   590.46,   590.35,   590.24,   590.13,   589.58,
BIN5(13,1)=   589.04,   588.49,   587.95,   587.41,   586.87,   586.33,
BIN5(19,1)=   585.79,   585.26,   584.72,   584.19,   583.66,   583.13,
BIN5(25,1)=   582.60,   582.08,   581.55,   581.03,   580.50,   575.23,
BIN5(31,1)=   570.10,   565.05,   560.14,   555.14,   550.28,   545.34,
BIN5(37,1)=   540.52,   535.77,   531.13,   526.55,   522.08,   517.53,
BIN5(43,1)=   513.09,   508.69,   504.39,   500.12,   495.96,   456.91,
BIN5(49,1)=   422.28,   391.66,   364.12,   339.73,   317.89,   298.28,
BIN5(55,1)=   280.65,   264.78,   250.47,   237.54,   225.85,   215.64,
BIN5(61,1)=   205.97,   197.23,   189.26,   181.99,   175.33,   132.52,
BIN5(67,1)=   109.72,    95.68,    85.69,    77.74,    71.42,    66.24,
BIN5(73,1)=    61.62,    57.47,    53.90,    50.81,    47.92,    45.22,
BIN5(79,1)=    42.83,    40.69,    38.77,    37.03,    35.36,    24.00,
BIN5(85,1)=    18.70,    15.94,    14.45,    13.56,    12.85,    12.38,
BIN5(91,1)=    11.96,    11.48,    11.05,    10.67,    10.33,     9.98,
BIN5(97,1)=     9.66,     9.38,     9.11,     8.87,     8.64,     6.32,
BIN5(103,1)=    5.07,     3.97,     3.25,     2.75,     2.37,     2.09,
BIN5(109,1)=    1.86,     1.64,     1.46,     1.32,     1.20,     1.09,
BIN5(115,1)=    1.01,    0.929,    0.863,    0.804,    0.752,    0.444,
BIN5(121,1)=   0.305,    0.228,    0.180,    0.148,    0.124,    0.107,
BIN5(127,1)=   0.093,    0.082,    0.073,    0.066,    0.060,    0.055,
BIN5(133,1)=   0.051,    0.047,    0.043,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:           BWR                                **
/COM, **    Decay Period (years):    900000                             **
/COM, **    Number of assemblies:    33968                              **
/COM, **    Assemblies/pkg:          44                                 **
/COM, **    Max Heat (Watts/assy):   400.00                             **
/COM, **    Min Heat (Watts/assy):   0.00                               **
/COM, **    Max Kinf:                1.000                              **
/COM, **    Min Kinf:                0.000                              **
/COM, **    Ave Age:                 18.874                             **
/COM, **    Ave Burnup:              43073.183                          **
/COM, **    Ave Enrichment:          3.357                              **
/COM, **    Ave MTU/assy:            0.174                              **
/COM, **                                                                **
/COM, ************************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   254.94,   254.88,   254.81,   254.74,   254.68,   254.61,
BIN6( 7,1)=   254.55,   254.48,   254.41,   254.35,   254.28,   253.95,
BIN6(13,1)=   253.63,   253.30,   252.98,   252.66,   252.34,   252.02,
BIN6(19,1)=   251.70,   251.39,   251.07,   250.76,   250.45,   250.14,
BIN6(25,1)=   249.83,   249.52,   249.21,   248.91,   248.61,   245.65,
BIN6(31,1)=   242.82,   240.06,   237.41,   234.83,   232.35,   229.90,
BIN6(37,1)=   227.54,   225.20,   222.94,   220.72,   218.57,   216.43,
BIN6(43,1)=   214.35,   212.29,   210.29,   208.30,   206.36,   188.47,
BIN6(49,1)=   172.94,   159.31,   147.25,   136.60,   127.11,   118.65,
BIN6(55,1)=   111.11,   104.35,    98.28,    92.82,    87.90,    83.50,
BIN6(61,1)=    79.50,    75.90,    72.63,    69.61,    68.87,    49.38,
BIN6(67,1)=    40.46,    34.96,    31.19,    28.19,    25.82,    23.89,
BIN6(73,1)=    22.21,    20.68,    19.37,    18.24,    17.20,    16.22,
BIN6(79,1)=    15.35,    14.58,    13.88,    13.25,    12.65,     8.55,
BIN6(85,1)=     6.64,     5.65,     5.11,     4.80,     4.54,     4.37,
BIN6(91,1)=     4.22,     4.05,     3.90,     3.76,     3.64,     3.51,
BIN6(97,1)=     3.40,     3.30,     3.20,     3.12,     3.03,     2.21,
BIN6(103,1)=     1.76,     1.38,     1.13,    0.951,    0.821,    0.720,
BIN6(109,1)=    0.641,    0.567,    0.506,    0.456,    0.415,    0.379,
BIN6(115,1)=    0.349,    0.322,    0.299,    0.279,    0.261,    0.155,
BIN6(121,1)=    0.107,    0.080,    0.063,    0.052,    0.044,    0.037,
BIN6(127,1)=    0.033,    0.029,    0.026,    0.023,    0.021,    0.019,
BIN6(133,1)=    0.018,    0.016,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                    **
/COM, **    Assembly Type:              BWR                                 **
/COM, **    Decay Period (years):       900000                              **
/COM, **    Number of assemblies:       89765                               **
/COM, **    Assemblies/pkg:             44                                  **
/COM, **    Max Heat (Watts/assy):      400.00                              **
/COM, **    Min Heat (Watts/assy):      0.00                                **
/COM, **    Max Kinf:                   1.370                               **
/COM, **    Min Kinf:                   1.000                               **
/COM, **    Ave Age:                    24.658                              **
/COM, **    Ave Burnup:                 29390.662                           **
/COM, **    Ave Enrichment:             2.976                               **
/COM, **    Ave MTU/assy:               0.178                               **
/COM, **                                                                    **
/COM, ************************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   155.29,   155.25,   155.21,   155.18,   155.14,   155.11,
BIN7( 7,1)=   155.07,   155.03,   155.00,   154.96,   154.93,   154.75,
BIN7(13,1)=   154.57,   154.39,   154.21,   154.04,   153.86,   153.69,
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BIN7(19,1)=   153.51,   153.34,   153.16,   152.99,   152.82,   152.65,
BIN7(25,1)=   152.48,   152.31,   152.14,   151.98,   151.81,   150.18,
BIN7(31,1)=   148.61,   147.09,   145.62,   144.18,   142.78,   141.41,
BIN7(37,1)=   140.08,   138.75,   137.46,   136.20,   134.98,   133.76,
BIN7(43,1)=   132.58,   131.40,   130.27,   129.13,   128.03,   117.71,
BIN7(49,1)=   108.67,   100.63,    93.51,    87.14,    81.45,    76.34,
BIN7(55,1)=    71.77,    67.66,    63.95,    60.61,    57.60,    54.88,
BIN7(61,1)=    52.43,    50.22,    48.19,    46.33,    44.64,    33.93,
BIN7(67,1)=    28.45,    25.08,    22.68,    20.75,    19.16,    17.84,
BIN7(73,1)=    16.64,    15.53,    14.58,    13.75,    12.98,    12.23,
BIN7(79,1)=    11.58,    10.99,    10.47,     9.99,     9.54,     6.41,
BIN7(85,1)=     4.95,     4.20,     3.80,     3.57,     3.38,     3.26,
BIN7(91,1)=     3.15,     3.03,     2.92,     2.82,     2.74,     2.65,
BIN7(97,1)=     2.57,     2.49,     2.42,     2.36,     2.30,     1.70,
BIN7(103,1)=     1.38,     1.08,    0.886,    0.749,    0.648,    0.571,
BIN7(109,1)=    0.509,    0.446,    0.395,    0.353,    0.319,    0.290,
BIN7(115,1)=    0.265,    0.244,    0.225,    0.209,    0.194,    0.111,
BIN7(121,1)=    0.074,    0.055,    0.043,    0.034,    0.029,    0.024,
BIN7(127,1)=    0.021,    0.018,    0.016,    0.015,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   1610                              **
/COM, **    Assemblies/pkg:         24                                **
/COM, **    Max Heat (Watts/assy):  520.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.540                             **
/COM, **    Min Kinf:               0.000                             **
/COM, **    Ave Age:                17.675                            **
/COM, **    Ave Burnup:             9685.796                          **
/COM, **    Ave Enrichment:         3.569                             **
/COM, **    Ave MTU/assy:           0.168                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    42.69,    42.68,    42.67,    42.66,    42.65,    42.64,
BIN8( 7,1)=    42.63,    42.62,    42.61,    42.59,    42.58,    42.53,
BIN8(13,1)=    42.48,    42.42,    42.37,    42.32,    42.26,    42.21,
BIN8(19,1)=    42.16,    42.11,    42.05,    42.00,    41.95,    41.90,
BIN8(25,1)=    41.85,    41.80,    41.75,    41.70,    41.65,    41.16,
BIN8(31,1)=    40.70,    40.24,    39.80,    39.35,    38.93,    38.51,
BIN8(37,1)=    38.10,    37.70,    37.31,    36.92,    36.55,    36.18,
BIN8(43,1)=    35.82,    35.45,    35.10,    34.75,    34.41,    31.26,
```

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BIN8(49,1)=    28.48,    26.05,    23.90,    21.98,    20.28,    18.76,
BIN8(55,1)=    17.40,    16.20,    15.12,    14.15,    13.29,    12.53,
BIN8(61,1)=    11.84,    11.23,    10.68,    10.19,     9.74,     7.19,
BIN8(67,1)=     6.09,     5.51,     5.12,     4.80,     4.53,     4.29,
BIN8(73,1)=     4.08,     3.86,     3.68,     3.52,     3.37,     3.22,
BIN8(79,1)=     3.09,     2.97,     2.87,     2.77,     2.68,     2.03,
BIN8(85,1)=     1.74,     1.58,     1.49,     1.43,     1.38,     1.34,
BIN8(91,1)=     1.31,     1.27,     1.23,     1.20,     1.17,     1.14,
BIN8(97,1)=     1.11,     1.09,     1.06,     1.04,     1.02,    0.803,
BIN8(103,1)=    0.677,    0.544,    0.455,    0.391,    0.343,    0.306,
BIN8(109,1)=    0.276,    0.239,    0.210,    0.187,    0.167,    0.151,
BIN8(115,1)=    0.137,    0.125,    0.115,    0.106,    0.099,    0.054,
BIN8(121,1)=    0.035,    0.025,    0.019,    0.015,    0.013,    0.011,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.005,    0.005,
BIN8(133,1)=    0.004,    0.004,    0.004,
BIN8( 1,0)=  0.000001,      0.01,      0.02,      0.03,      0.04,      0.05,
BIN8( 7,0)=      0.06,      0.07,      0.08,      0.09,      0.10,      0.15,
BIN8(13,0)=      0.20,      0.25,      0.30,      0.35,      0.40,      0.45,
BIN8(19,0)=      0.50,      0.55,      0.60,      0.65,      0.70,      0.75,
BIN8(25,0)=      0.80,      0.85,      0.90,      0.95,      1.00,      1.50,
BIN8(31,0)=      2.00,      2.50,      3.00,      3.50,      4.00,      4.50,
BIN8(37,0)=      5.00,      5.50,      6.00,      6.50,      7.00,      7.50,
BIN8(43,0)=      8.00,      8.50,      9.00,      9.50,     10.00,     15.00,
BIN8(49,0)=     20.00,     25.00,     30.00,     35.00,     40.00,     45.00,
BIN8(55,0)=     50.00,     55.00,     60.00,     65.00,     70.00,     75.00,
BIN8(61,0)=     80.00,     85.00,     90.00,     95.00,    100.00,    150.00,
BIN8(67,0)=    200.00,    250.00,    300.00,    350.00,    400.00,    450.00,
BIN8(73,0)=    500.00,    550.00,    600.00,    650.00,    700.00,    750.00,
BIN8(79,0)=    800.00,    850.00,    900.00,    950.00,   1000.00,   1500.00,
BIN8(85,0)=   2000.00,   2500.00,   3000.00,   3500.00,   4000.00,   4500.00,
BIN8(91,0)=   5000.00,   5500.00,   6000.00,   6500.00,   7000.00,   7500.00,
BIN8(97,0)=   8000.00,   8500.00,   9000.00,   9500.00,  10000.00,  15000.00,
BIN8(103,0)=  20000.00,  25000.00,  30000.00,  35000.00,  40000.00,  45000.00,
BIN8(109,0)=  50000.00,  55000.00,  60000.00,  65000.00,  70000.00,  75000.00,
BIN8(115,0)=  80000.00,  85000.00,  90000.00,  95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
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/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case9.wsm                          **
/COM, **    Output File Name:       finalw9.dat                        **
/COM, **    Execution Date:         08/11/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   34926                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                28.779                             **
/COM, **    Ave Burnup:             44738.206                          **
/COM, **    Ave Enrichment:         3.731                              **
/COM, **    Ave MTU/assy:           0.429                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   506.06,   505.93,   505.81,   505.69,   505.56,   505.44,
BIN1( 7,1)=   505.32,   505.19,   505.07,   504.95,   504.83,   504.21,
BIN1(13,1)=   503.61,   503.00,   502.40,   501.80,   501.20,   500.60,
BIN1(19,1)=   500.01,   499.42,   498.83,   498.25,   497.67,   497.09,
BIN1(25,1)=   496.51,   495.93,   495.36,   494.79,   494.23,   488.71,
BIN1(31,1)=   483.40,   478.27,   473.33,   468.52,   463.88,   459.35,
BIN1(37,1)=   454.95,   450.53,   446.24,   442.07,   438.02,   434.00,
BIN1(43,1)=   430.10,   426.23,   422.46,   418.75,   415.13,   381.14,
BIN1(49,1)=   351.56,   325.32,   302.08,   281.37,   262.86,   246.23,
BIN1(55,1)=   231.37,   218.01,   206.03,   195.17,   185.36,   176.48,
BIN1(61,1)=   168.45,   161.20,   154.60,   148.51,   142.97,   107.60,
BIN1(67,1)=    89.31,    78.20,    70.29,    64.05,    59.03,    54.91,
BIN1(73,1)=    51.19,    47.86,    44.99,    42.50,    40.15,    37.96,
BIN1(79,1)=    36.02,    34.29,    32.73,    31.31,    29.94,    20.67,
BIN1(85,1)=    16.32,    14.03,    12.78,    12.02,    11.41,    10.99,
BIN1(91,1)=    10.63,    10.20,     9.82,     9.49,     9.19,     8.87,
BIN1(97,1)=     8.59,     8.33,     8.09,     7.88,     7.67,     5.61,
BIN1(103,1)=     4.49,     3.51,     2.87,     2.42,     2.09,     1.83,
BIN1(109,1)=     1.63,     1.43,     1.27,     1.14,     1.03,    0.935,
BIN1(115,1)=    0.856,    0.788,    0.729,    0.677,    0.631,    0.363,
BIN1(121,1)=    0.245,    0.181,    0.141,    0.114,    0.095,    0.081,
BIN1(127,1)=    0.070,    0.062,    0.055,    0.049,    0.044,    0.040,
BIN1(133,1)=    0.037,    0.034,    0.031,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
```

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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:            PWR                             **
/COM, **    Decay Period (years):     900000                          **
/COM, **    Number of assemblies:     75739                           **
/COM, **    Assemblies/pkg:           21                              **
/COM, **    Max Heat (Watts/assy):    850.00                          **
/COM, **    Min Heat (Watts/assy):    0.00                            **
/COM, **    Max Kinf:                 1.130                           **
/COM, **    Min Kinf:                 1.000                           **
/COM, **    Ave Age:                  26.649                          **
/COM, **    Ave Burnup:               36936.948                       **
/COM, **    Ave Enrichment:           3.678                           **
/COM, **    Ave MTU/assy:             0.431                           **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   446.59,   446.43,   446.28,   446.12,   445.97,   445.82,
BIN2( 7,1)=   445.67,   445.51,   445.36,   445.21,   445.05,   444.30,
BIN2(13,1)=   443.54,   442.80,   442.06,   441.32,   440.58,   439.86,
BIN2(19,1)=   439.13,   438.41,   437.70,   436.99,   436.28,   435.58,
BIN2(25,1)=   434.89,   434.19,   433.51,   432.82,   432.14,   425.96,
BIN2(31,1)=   420.12,   414.69,   409.53,   404.68,   400.03,   395.68,
BIN2(37,1)=   391.49,   387.14,   382.95,   379.06,   375.31,   371.64,
BIN2(43,1)=   368.09,   364.60,   361.22,   358.01,   354.89,   324.66,
BIN2(49,1)=   299.13,   276.21,   256.02,   238.02,   222.13,   207.54,
BIN2(55,1)=   194.62,   183.00,   172.56,   163.13,   154.61,   146.90,
BIN2(61,1)=   139.93,   133.62,   128.07,   122.77,   118.03,    88.17,
BIN2(67,1)=    73.41,    64.60,    58.41,    53.48,    49.46,    46.11,
BIN2(73,1)=    43.07,    40.30,    37.91,    35.83,    33.87,    32.01,
BIN2(79,1)=    30.37,    28.90,    27.57,    26.38,    25.22,    17.33,
BIN2(85,1)=    13.64,    11.71,    10.66,    10.04,     9.54,     9.20,
BIN2(91,1)=     8.90,     8.55,     8.24,     7.97,     7.73,     7.47,
BIN2(97,1)=     7.24,     7.03,     6.84,     6.66,     6.49,     4.80,
BIN2(103,1)=    3.87,     3.04,     2.49,     2.11,     1.82,     1.60,
BIN2(109,1)=    1.43,     1.25,     1.10,    0.986,    0.889,    0.806,
BIN2(115,1)=   0.736,    0.676,    0.624,    0.578,    0.538,    0.304,
BIN2(121,1)=   0.203,    0.148,    0.115,    0.093,    0.077,    0.065,
BIN2(127,1)=   0.056,    0.049,    0.043,    0.039,    0.035,    0.032,
BIN2(133,1)=   0.029,    0.027,    0.025,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
```

```
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     5424                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  24.356                            **
/COM, **    Ave Burnup:               18566.758                         **
/COM, **    Ave Enrichment:           3.747                             **
/COM, **    Ave MTU/assy:             0.412                             **
/COM, **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   216.20,   216.08,   215.96,   215.84,   215.72,   215.60,
BIN3( 7,1)=   215.47,   215.35,   215.23,   215.11,   214.99,   214.40,
BIN3(13,1)=   213.81,   213.23,   212.66,   212.09,   211.53,   210.98,
BIN3(19,1)=   210.43,   209.89,   209.35,   208.82,   208.30,   207.78,
BIN3(25,1)=   207.27,   206.76,   206.26,   205.76,   205.27,   201.16,
BIN3(31,1)=   197.38,   194.18,   191.18,   188.47,   185.90,   183.55,
BIN3(37,1)=   181.31,   179.14,   177.06,   175.05,   173.12,   171.25,
BIN3(43,1)=   169.46,   167.67,   165.96,   164.29,   162.67,   147.84,
BIN3(49,1)=   135.15,   123.96,   114.02,   105.18,    97.28,    90.20,
BIN3(55,1)=    83.87,    78.21,    73.14,    68.58,    64.50,    60.83,
BIN3(61,1)=    57.54,    54.57,    51.95,    49.57,    47.41,    34.57,
BIN3(67,1)=    28.95,    25.92,    23.87,    22.22,    20.83,    19.63,
BIN3(73,1)=    18.52,    17.46,    16.55,    15.74,    14.98,    14.25,
BIN3(79,1)=    13.59,    13.00,    12.47,    11.99,    11.52,     8.32,
BIN3(85,1)=     6.82,     6.03,     5.59,     5.32,     5.09,     4.93,
BIN3(91,1)=     4.79,     4.63,     4.48,     4.36,     4.24,     4.12,
BIN3(97,1)=     4.00,     3.90,     3.81,     3.72,     3.64,     2.79,
BIN3(103,1)=     2.31,     1.84,     1.53,     1.30,     1.14,     1.01,
BIN3(109,1)=    0.905,    0.787,    0.693,    0.616,    0.552,    0.499,
BIN3(115,1)=    0.454,    0.415,    0.382,    0.353,    0.327,    0.180,
BIN3(121,1)=    0.118,    0.085,    0.065,    0.052,    0.043,    0.036,
BIN3(127,1)=    0.031,    0.027,    0.024,    0.021,    0.019,    0.017,
BIN3(133,1)=    0.016,    0.014,    0.013,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     10372                             **
/COM, **    Assemblies/pkg:           12                                **
```

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/COM, **                                                                **
/COM, **    Max Heat (Watts/assy):  1500.00                             **
/COM, **    Min Heat (Watts/assy):  850.00                              **
/COM, **    Max Kinf:               1.020                               **
/COM, **    Min Kinf:               0.000                               **
/COM, **    Ave Age:                9.889                               **
/COM, **    Ave Burnup:             53844.819                           **
/COM, **    Ave Enrichment:         4.255                               **
/COM, **    Ave MTU/assy:           0.446                               **
/COM, **
/COM, ***********************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   981.61,   981.09,   980.57,   980.05,   979.53,   979.01,
BIN4( 7,1)=   978.50,   977.98,   977.47,   976.95,   976.44,   973.89,
BIN4(13,1)=   971.36,   968.86,   966.37,   963.91,   961.47,   959.05,
BIN4(19,1)=   956.65,   954.27,   951.91,   949.57,   947.26,   944.95,
BIN4(25,1)=   942.67,   940.41,   938.16,   935.93,   933.73,   914.27,
BIN4(31,1)=   896.15,   879.88,   864.60,   850.68,   837.53,   825.62,
BIN4(37,1)=   814.29,   802.49,   791.25,   781.24,   771.67,   762.26,
BIN4(43,1)=   753.23,   744.51,   736.12,   728.43,   721.01,   649.18,
BIN4(49,1)=   590.40,   538.57,   493.67,   454.05,   419.61,   387.95,
BIN4(55,1)=   360.33,   335.67,   313.60,   293.80,   276.01,   259.99,
BIN4(61,1)=   245.56,   232.53,   221.28,   210.38,   200.67,   140.08,
BIN4(67,1)=   111.45,    94.68,    83.85,    75.48,    68.92,    63.75,
BIN4(73,1)=    59.37,    55.38,    51.97,    49.02,    46.39,    43.90,
BIN4(79,1)=    41.70,    39.73,    37.95,    36.34,    34.86,    24.43,
BIN4(85,1)=    19.56,    16.95,    15.49,    14.59,    13.85,    13.34,
BIN4(91,1)=    12.90,    12.36,    11.88,    11.46,    11.09,    10.70,
BIN4(97,1)=    10.34,    10.02,     9.73,     9.45,     9.20,     6.65,
BIN4(103,1)=    5.28,     4.11,     3.35,     2.81,     2.42,     2.12,
BIN4(109,1)=    1.88,     1.66,     1.48,     1.34,     1.21,     1.11,
BIN4(115,1)=    1.02,    0.941,    0.873,    0.814,    0.761,    0.448,
BIN4(121,1)=   0.307,    0.230,    0.181,    0.148,    0.124,    0.107,
BIN4(127,1)=   0.093,    0.082,    0.073,    0.066,    0.060,    0.055,
BIN4(133,1)=   0.050,    0.046,    0.043,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ***********************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:          STx                                 **
/COM, **    Decay Period (years):   900000                              **
/COM, **    Number of assemblies:   3329                                **
/COM, **    Assemblies/pkg:         12                                  **
/COM, **    Max Heat (Watts/assy):  1500.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                                **
/COM, **    Max Kinf:               1.130                               **
/COM, **    Min Kinf:               0.000                               **
/COM, **    Ave Age:                15.783                              **
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/COM, **    Ave Burnup:            42730.780                    **
/COM, **    Ave Enrichment:        3.767                        **
/COM, **    Ave MTU/assy:          0.539                        **
/COM, **                                                        **
/COM, ******************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   891.65,   891.20,   890.76,   890.32,   889.87,   889.43,
BIN5( 7,1)=   888.99,   888.55,   888.12,   887.68,   887.24,   885.07,
BIN5(13,1)=   882.93,   880.80,   878.69,   876.60,   874.53,   872.48,
BIN5(19,1)=   870.45,   868.43,   866.44,   864.46,   862.49,   860.55,
BIN5(25,1)=   858.62,   856.71,   854.81,   852.93,   851.07,   834.57,
BIN5(31,1)=   819.23,   805.58,   792.75,   781.08,   770.02,   759.87,
BIN5(37,1)=   750.20,   740.46,   731.15,   722.56,   714.32,   706.33,
BIN5(43,1)=   698.66,   691.21,   684.04,   677.26,   670.71,   608.57,
BIN5(49,1)=   556.78,   511.03,   471.07,   435.63,   404.68,   376.24,
BIN5(55,1)=   351.25,   328.93,   308.91,   290.89,   274.67,   260.02,
BIN5(61,1)=   246.81,   234.83,   224.45,   214.40,   205.38,   148.48,
BIN5(67,1)=   120.51,   103.57,    92.25,    83.26,    76.16,    70.44,
BIN5(73,1)=    65.50,    60.98,    57.11,    53.77,    50.74,    47.84,
BIN5(79,1)=    45.28,    43.00,    40.95,    39.10,    37.36,    25.30,
BIN5(85,1)=    19.70,    16.78,    15.20,    14.27,    13.52,    13.02,
BIN5(91,1)=    12.58,    12.07,    11.61,    11.21,    10.85,    10.48,
BIN5(97,1)=    10.15,     9.84,     9.56,     9.30,     9.06,     6.62,
BIN5(103,1)=    5.29,     4.14,     3.39,     2.87,     2.48,     2.18,
BIN5(109,1)=    1.94,     1.71,     1.53,     1.38,     1.26,     1.15,
BIN5(115,1)=    1.06,    0.979,    0.910,    0.849,    0.795,    0.472,
BIN5(121,1)=   0.326,    0.245,    0.194,    0.159,    0.134,    0.115,
BIN5(127,1)=   0.101,    0.089,    0.080,    0.072,    0.065,    0.060,
BIN5(133,1)=   0.055,    0.051,    0.047,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                        **
/COM, **    Assembly Type:         BWR                          **
/COM, **    Decay Period (years):  900000                       **
/COM, **    Number of assemblies:  43823                        **
/COM, **    Assemblies/pkg:        44                           **
/COM, **    Max Heat (Watts/assy): 400.00                       **
/COM, **    Min Heat (Watts/assy): 0.00                         **
/COM, **    Max Kinf:              1.000                        **
/COM, **    Min Kinf:              0.000                        **
/COM, **    Ave Age:               18.241                       **
/COM, **    Ave Burnup:            43175.618                    **
/COM, **    Ave Enrichment:        3.366                        **
/COM, **    Ave MTU/assy:          0.174                        **
/COM, **                                                        **
/COM, ******************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   276.48,   276.38,   276.28,   276.18,   276.08,   275.98,
BIN6( 7,1)=   275.88,   275.79,   275.69,   275.59,   275.49,   275.00,
BIN6(13,1)=   274.52,   274.03,   273.55,   273.08,   272.60,   272.13,
BIN6(19,1)=   271.66,   271.20,   270.74,   270.28,   269.82,   269.37,
BIN6(25,1)=   268.91,   268.47,   268.02,   267.58,   267.14,   263.04,
BIN6(31,1)=   259.16,   255.55,   252.11,   248.89,   245.81,   242.91,
BIN6(37,1)=   240.14,   237.27,   234.51,   231.92,   229.42,   226.97,
BIN6(43,1)=   224.62,   222.33,   220.12,   218.03,   216.01,   196.32,
BIN6(49,1)=   179.86,   165.18,   152.44,   141.15,   131.29,   122.20,
BIN6(55,1)=   114.27,   107.18,   100.82,    95.10,    89.95,    85.31,
BIN6(61,1)=    81.11,    77.33,    74.06,    70.81,    67.96,    49.79,
BIN6(67,1)=    40.68,    35.08,    31.28,    28.26,    25.86,    23.93,
BIN6(73,1)=    22.24,    20.71,    19.39,    18.26,    17.22,    16.23,
BIN6(79,1)=    15.36,    14.59,    13.89,    13.26,    12.66,     8.55,
BIN6(85,1)=     6.64,     5.65,     5.11,     4.80,     4.54,     4.37,
BIN6(91,1)=     4.23,     4.05,     3.90,     3.76,     3.64,     3.52,
BIN6(97,1)=     3.40,     3.30,     3.20,     3.12,     3.04,     2.21,
BIN6(103,1)=     1.77,     1.38,     1.13,    0.951,    0.821,    0.721,
BIN6(109,1)=    0.642,    0.567,    0.507,    0.457,    0.415,    0.379,
BIN6(115,1)=    0.349,    0.323,    0.300,    0.279,    0.261,    0.155,
BIN6(121,1)=    0.107,    0.080,    0.063,    0.052,    0.044,    0.037,
BIN6(127,1)=    0.033,    0.029,    0.026,    0.023,    0.021,    0.019,
BIN6(133,1)=    0.018,    0.017,    0.015,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:            BWR                              **
/COM, **    Decay Period (years):     900000                           **
/COM, **    Number of assemblies:     119152                           **
/COM, **    Assemblies/pkg:           44                               **
/COM, **    Max Heat (Watts/assy):    400.00                           **
/COM, **    Min Heat (Watts/assy):    0.00                             **
/COM, **    Max Kinf:                 1.370                            **
/COM, **    Min Kinf:                 1.000                            **
/COM, **    Ave Age:                  29.844                           **
/COM, **    Ave Burnup:               28850.353                        **
/COM, **    Ave Enrichment:           2.966                            **
/COM, **    Ave MTU/assy:             0.178                            **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   145.89,   145.85,   145.80,   145.76,   145.71,   145.67,
BIN7( 7,1)=   145.62,   145.58,   145.54,   145.49,   145.45,   145.23,
BIN7(13,1)=   145.01,   144.79,   144.57,   144.36,   144.14,   143.93,
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BIN7(19,1)=   143.72,   143.51,   143.30,   143.10,   142.89,   142.68,
BIN7(25,1)=   142.48,   142.28,   142.08,   141.88,   141.68,   139.83,
BIN7(31,1)=   138.08,   136.45,   134.90,   133.42,   132.00,   130.67,
BIN7(37,1)=   129.38,   128.07,   126.80,   125.59,   124.42,   123.27,
BIN7(43,1)=   122.15,   121.05,   119.98,   118.96,   117.97,   108.47,
BIN7(49,1)=   100.33,    93.04,    86.60,    80.86,    75.77,    71.11,
BIN7(55,1)=    66.98,    63.26,    59.93,    56.91,    54.18,    51.70,
BIN7(61,1)=    49.46,    47.44,    45.64,    43.92,    42.39,    32.56,
BIN7(67,1)=    27.48,    24.33,    22.05,    20.20,    18.68,    17.41,
BIN7(73,1)=    16.23,    15.16,    14.25,    13.45,    12.68,    11.96,
BIN7(79,1)=    11.32,    10.76,    10.25,     9.78,     9.33,     6.28,
BIN7(85,1)=     4.86,     4.13,     3.74,     3.51,     3.33,     3.21,
BIN7(91,1)=     3.10,     2.98,     2.87,     2.78,     2.70,     2.61,
BIN7(97,1)=     2.53,     2.45,     2.39,     2.33,     2.27,     1.68,
BIN7(103,1)=     1.36,     1.07,    0.874,    0.740,    0.640,    0.564,
BIN7(109,1)=    0.503,    0.440,    0.390,    0.349,    0.314,    0.286,
BIN7(115,1)=    0.261,    0.240,    0.222,    0.205,    0.191,    0.109,
BIN7(121,1)=    0.073,    0.054,    0.042,    0.034,    0.028,    0.024,
BIN7(127,1)=    0.021,    0.018,    0.016,    0.014,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   4777                              **
/COM, **    Assemblies/pkg:         24                                **
/COM, **    Max Heat (Watts/assy):  520.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.540                             **
/COM, **    Min Kinf:               0.000                             **
/COM, **    Ave Age:                10.609                            **
/COM, **    Ave Burnup:             33083.773                         **
/COM, **    Ave Enrichment:         3.760                             **
/COM, **    Ave MTU/assy:           0.171                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=   253.28,   253.08,   252.89,   252.69,   252.50,   252.30,
BIN8( 7,1)=   252.11,   251.92,   251.73,   251.54,   251.35,   250.40,
BIN8(13,1)=   249.46,   248.54,   247.62,   246.72,   245.83,   244.95,
BIN8(19,1)=   244.07,   243.21,   242.36,   241.51,   240.68,   239.86,
BIN8(25,1)=   239.04,   238.23,   237.44,   236.65,   235.87,   229.18,
BIN8(31,1)=   223.09,   217.96,   213.22,   208.97,   205.00,   201.46,
BIN8(37,1)=   198.13,   195.00,   192.04,   189.26,   186.63,   184.16,
BIN8(43,1)=   181.80,   179.47,   177.24,   175.14,   173.13,   155.49,
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BIN8(49,1)=   140.87,   128.41,   117.49,   107.91,    99.50,    92.05,
BIN8(55,1)=    85.38,    79.49,    74.23,    69.51,    65.29,    61.49,
BIN8(61,1)=    58.07,    54.99,    52.22,    49.80,    47.47,    33.19,
BIN8(67,1)=    26.46,    22.45,    19.88,    17.87,    16.29,    15.05,
BIN8(73,1)=    14.01,    13.05,    12.23,    11.53,    10.90,    10.31,
BIN8(79,1)=     9.78,     9.31,     8.89,     8.51,     8.16,     5.69,
BIN8(85,1)=     4.54,     3.94,     3.61,     3.40,     3.24,     3.12,
BIN8(91,1)=     3.02,     2.90,     2.80,     2.70,     2.62,     2.53,
BIN8(97,1)=     2.45,     2.38,     2.31,     2.25,     2.20,     1.62,
BIN8(103,1)=     1.30,     1.03,    0.843,    0.714,    0.619,    0.545,
BIN8(109,1)=    0.487,    0.430,    0.385,    0.347,    0.315,    0.288,
BIN8(115,1)=    0.265,    0.246,    0.228,    0.213,    0.199,    0.118,
BIN8(121,1)=    0.082,    0.062,    0.049,    0.040,    0.034,    0.029,
BIN8(127,1)=    0.026,    0.023,    0.020,    0.018,    0.017,    0.015,
BIN8(133,1)=    0.014,    0.013,    0.012,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.00D **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case10.wsm                         **
/COM, **    Output File Name:       finalw10.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   38744                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                25.921                             **
/COM, **    Ave Burnup:             45421.473                          **
/COM, **    Ave Enrichment:         3.795                              **
/COM, **    Ave MTU/assy:           0.431                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   539.36,   539.22,   539.09,   538.96,   538.82,   538.69,
BIN1( 7,1)=   538.56,   538.43,   538.29,   538.16,   538.03,   537.37,
BIN1(13,1)=   536.72,   536.06,   535.41,   534.77,   534.12,   533.48,
BIN1(19,1)=   532.84,   532.21,   531.58,   530.94,   530.32,   529.69,
BIN1(25,1)=   529.07,   528.45,   527.83,   527.22,   526.61,   520.67,
BIN1(31,1)=   514.97,   509.41,   504.06,   498.87,   493.85,   488.93,
BIN1(37,1)=   484.17,   479.37,   474.72,   470.21,   465.84,   461.49,
BIN1(43,1)=   457.27,   453.07,   448.98,   444.97,   441.05,   404.31,
BIN1(49,1)=   372.33,   343.98,   318.92,   296.58,   276.66,   258.76,
BIN1(55,1)=   242.78,   228.43,   215.51,   203.84,   193.33,   183.82,
BIN1(61,1)=   175.23,   167.47,   160.41,   153.89,   147.98,   110.37,
BIN1(67,1)=    91.16,    79.55,    71.41,    64.98,    59.84,    55.63,
BIN1(73,1)=    51.86,    48.47,    45.55,    43.02,    40.65,    38.44,
BIN1(79,1)=    36.47,    34.72,    33.14,    31.70,    30.33,    20.95,
BIN1(85,1)=    16.55,    14.24,    12.97,    12.21,    11.59,    11.16,
BIN1(91,1)=    10.79,    10.36,     9.97,     9.63,     9.32,     9.00,
BIN1(97,1)=     8.72,     8.45,     8.21,     7.99,     7.78,     5.69,
BIN1(103,1)=     4.55,     3.56,     2.91,     2.45,     2.11,     1.85,
BIN1(109,1)=     1.65,     1.45,     1.29,     1.15,     1.04,    0.949,
BIN1(115,1)=    0.869,    0.800,    0.741,    0.688,    0.642,    0.369,
BIN1(121,1)=    0.250,    0.184,    0.144,    0.117,    0.097,    0.083,
BIN1(127,1)=    0.072,    0.063,    0.056,    0.050,    0.046,    0.041,
BIN1(133,1)=    0.038,    0.035,    0.032,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
```

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BIN1(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN1(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN1(133,0)= 800000.00, 850000.00, 900000.00,
BIN1( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:          PWR                                 **
/COM, **    Decay Period (years):   900000                              **
/COM, **    Number of assemblies:   76081                               **
/COM, **    Assemblies/pkg:         21                                  **
/COM, **    Max Heat (Watts/assy):  850.00                              **
/COM, **    Min Heat (Watts/assy):  0.00                                **
/COM, **    Max Kinf:               1.130                               **
/COM, **    Min Kinf:               1.000                               **
/COM, **    Ave Age:                26.915                              **
/COM, **    Ave Burnup:             36869.327                           **
/COM, **    Ave Enrichment:         3.674                               **
/COM, **    Ave MTU/assy:           0.431                               **
/COM, **                                                                **
/COM, ******************************************************************
*SET,BIN2,
*DIM,BIN2,TABLE,135,1,
BIN2( 1,1)=   440.81,   440.67,   440.53,   440.40,   440.26,   440.12,
BIN2( 7,1)=   439.98,   439.84,   439.71,   439.57,   439.43,   438.75,
BIN2(13,1)=   438.07,   437.39,   436.72,   436.05,   435.38,   434.72,
BIN2(19,1)=   434.06,   433.41,   432.76,   432.11,   431.47,   430.83,
BIN2(25,1)=   430.20,   429.56,   428.93,   428.31,   427.69,   421.96,
BIN2(31,1)=   416.52,   411.40,   406.50,   401.87,   397.42,   393.22,
BIN2(37,1)=   389.19,   384.92,   380.81,   377.03,   373.37,   369.76,
BIN2(43,1)=   366.27,   362.83,   359.50,   356.34,   353.27,   323.30,
BIN2(49,1)=   297.96,   275.13,   255.04,   237.13,   221.32,   206.78,
BIN2(55,1)=   193.93,   182.38,   171.96,   162.56,   154.08,   146.41,
BIN2(61,1)=   139.47,   133.20,   127.68,   122.38,   117.67,    87.93,
BIN2(67,1)=    73.23,    64.45,    58.28,    53.37,    49.35,    46.01,
BIN2(73,1)=    42.98,    40.21,    37.83,    35.76,    33.79,    31.95,
BIN2(79,1)=    30.30,    28.84,    27.52,    26.32,    25.17,    17.29,
BIN2(85,1)=    13.60,    11.68,    10.64,    10.02,     9.52,     9.18,
BIN2(91,1)=     8.88,     8.53,     8.23,     7.95,     7.71,     7.46,
BIN2(97,1)=     7.22,     7.01,     6.82,     6.64,     6.47,     4.79,
BIN2(103,1)=    3.86,     3.03,     2.49,     2.10,     1.82,     1.60,
BIN2(109,1)=    1.42,     1.25,     1.10,    0.984,    0.887,    0.805,
BIN2(115,1)=   0.735,    0.675,    0.622,    0.577,    0.537,    0.303,
BIN2(121,1)=   0.202,    0.148,    0.115,    0.092,    0.076,    0.065,
BIN2(127,1)=   0.056,    0.049,    0.043,    0.039,    0.035,    0.032,
BIN2(133,1)=   0.029,    0.027,    0.025,
BIN2( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN2( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN2(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN2(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN2(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN2(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN2(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN2(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN2(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN2(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN2(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN2(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN2(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN2(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN2(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN2(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN2(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN2(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN2(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN2(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN2(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN2(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN2(133,0)= 800000.00, 850000.00, 900000.00,
BIN2( 0,1)=1.0
/COM, ******************************************************************
```

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/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     5315                              **
/COM, **    Assemblies/pkg:           21                                **
/COM, **    Max Heat (Watts/assy):    850.00                            **
/COM, **    Min Heat (Watts/assy):    0.00                              **
/COM, **    Max Kinf:                 1.450                             **
/COM, **    Min Kinf:                 1.130                             **
/COM, **    Ave Age:                  23.263                            **
/COM, **    Ave Burnup:               18334.278                         **
/COM, **    Ave Enrichment:           3.739                             **
/COM, **    Ave MTU/assy:             0.414                             **
/COM, **
/COM, ************************************************************************
*SET,BIN3,
*DIM,BIN3,TABLE,135,1,
BIN3( 1,1)=   206.44,   206.36,   206.28,   206.21,   206.13,   206.05,
BIN3( 7,1)=   205.98,   205.90,   205.83,   205.75,   205.67,   205.30,
BIN3(13,1)=   204.92,   204.55,   204.18,   203.81,   203.45,   203.09,
BIN3(19,1)=   202.73,   202.38,   202.03,   201.68,   201.33,   200.99,
BIN3(25,1)=   200.64,   200.31,   199.97,   199.63,   199.30,   196.32,
BIN3(31,1)=   193.51,   190.92,   188.47,   186.15,   183.94,   181.84,
BIN3(37,1)=   179.83,   177.76,   175.78,   173.91,   172.10,   170.31,
BIN3(43,1)=   168.58,   166.89,   165.24,   163.63,   162.07,   147.40,
BIN3(49,1)=   134.86,   123.65,   113.74,   104.92,    97.09,    89.94,
BIN3(55,1)=    83.65,    77.98,    72.92,    68.39,    64.30,    60.64,
BIN3(61,1)=    57.36,    54.39,    51.82,    49.38,    47.23,    34.46,
BIN3(67,1)=    28.86,    25.84,    23.80,    22.16,    20.78,    19.58,
BIN3(73,1)=    18.47,    17.42,    16.51,    15.71,    14.95,    14.22,
BIN3(79,1)=    13.57,    12.98,    12.45,    11.96,    11.50,     8.31,
BIN3(85,1)=     6.82,     6.02,     5.58,     5.31,     5.09,     4.93,
BIN3(91,1)=     4.79,     4.63,     4.48,     4.36,     4.24,     4.12,
BIN3(97,1)=     4.00,     3.90,     3.81,     3.72,     3.64,     2.79,
BIN3(103,1)=     2.31,     1.84,     1.53,     1.31,     1.14,     1.01,
BIN3(109,1)=    0.907,    0.788,    0.694,    0.617,    0.553,    0.500,
BIN3(115,1)=    0.455,    0.416,    0.382,    0.353,    0.328,    0.181,
BIN3(121,1)=    0.118,    0.085,    0.065,    0.052,    0.043,    0.036,
BIN3(127,1)=    0.031,    0.027,    0.024,    0.021,    0.019,    0.017,
BIN3(133,1)=    0.016,    0.014,    0.013,
BIN3( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN3( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN3(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN3(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN3(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN3(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN3(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN3(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN3(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN3(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN3(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN3(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN3(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN3(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN3(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN3(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN3(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN3(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN3(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN3(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN3(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN3(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN3(133,0)= 800000.00, 850000.00, 900000.00,
BIN3( 0,1)=1.0
/COM, ************************************************************************
/COM, **                                                                **
/COM, **    Assembly Type:            PWR                               **
/COM, **    Decay Period (years):     900000                            **
/COM, **    Number of assemblies:     7660                              **
/COM, **    Assemblies/pkg:           12                                **
```

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/COM, **    Max Heat (Watts/assy):  1500.00                          **
/COM, **    Min Heat (Watts/assy):  850.00                           **
/COM, **    Max Kinf:               1.020                            **
/COM, **    Min Kinf:               0.000                            **
/COM, **    Ave Age:                11.051                           **
/COM, **    Ave Burnup:             54669.393                        **
/COM, **    Ave Enrichment:         4.263                            **
/COM, **    Ave MTU/assy:           0.446                            **
/COM, **
/COM, ********************************************************************
*SET,BIN4,
*DIM,BIN4,TABLE,135,1,
BIN4( 1,1)=   940.85,   940.47,   940.08,   939.70,   939.31,   938.93,
BIN4( 7,1)=   938.54,   938.16,   937.78,   937.39,   937.01,   935.11,
BIN4(13,1)=   933.22,   931.34,   929.48,   927.63,   925.79,   923.96,
BIN4(19,1)=   922.15,   920.35,   918.55,   916.77,   915.01,   913.25,
BIN4(25,1)=   911.50,   909.77,   908.04,   906.33,   904.62,   889.13,
BIN4(31,1)=   874.52,   860.92,   848.02,   836.03,   824.60,   813.99,
BIN4(37,1)=   803.85,   792.96,   782.55,   773.31,   764.44,   755.67,
BIN4(43,1)=   747.24,   739.01,   731.08,   723.72,   716.61,   646.40,
BIN4(49,1)=   588.59,   537.15,   492.69,   453.40,   419.26,   387.77,
BIN4(55,1)=   360.38,   335.88,   313.94,   294.27,   276.59,   260.66,
BIN4(61,1)=   246.31,   233.37,   222.25,   211.29,   201.64,   141.21,
BIN4(67,1)=   112.42,    95.52,    84.55,    76.09,    69.47,    64.26,
BIN4(73,1)=    59.83,    55.82,    52.39,    49.42,    46.77,    44.28,
BIN4(79,1)=    42.06,    40.08,    38.30,    36.69,    35.19,    24.73,
BIN4(85,1)=    19.83,    17.20,    15.73,    14.82,    14.07,    13.55,
BIN4(91,1)=    13.10,    12.55,    12.06,    11.64,    11.25,    10.85,
BIN4(97,1)=    10.49,    10.17,     9.87,     9.59,     9.33,     6.74,
BIN4(103,1)=    5.34,     4.16,     3.38,     2.84,     2.45,     2.14,
BIN4(109,1)=    1.90,     1.68,     1.50,     1.35,     1.23,     1.12,
BIN4(115,1)=    1.03,    0.953,    0.884,    0.824,    0.771,    0.454,
BIN4(121,1)=   0.312,    0.234,    0.184,    0.151,    0.127,    0.109,
BIN4(127,1)=   0.095,    0.084,    0.075,    0.067,    0.061,    0.056,
BIN4(133,1)=   0.051,    0.047,    0.044,
BIN4( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN4( 7,0)=     0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN4(13,0)=     0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN4(19,0)=     0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN4(25,0)=     0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN4(31,0)=     2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN4(37,0)=     5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN4(43,0)=     8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN4(49,0)=    20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN4(55,0)=    50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN4(61,0)=    80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN4(67,0)=   200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN4(73,0)=   500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN4(79,0)=   800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN4(85,0)=  2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN4(91,0)=  5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN4(97,0)=  8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN4(103,0)= 20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN4(109,0)= 50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN4(115,0)= 80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN4(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN4(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN4(133,0)= 800000.00, 850000.00, 900000.00,
BIN4( 0,1)=1.0
/COM, ********************************************************************
/COM, **                                                                 **
/COM, **    Assembly Type:          STx                                  **
/COM, **    Decay Period (years):   900000                               **
/COM, **    Number of assemblies:   3329                                 **
/COM, **    Assemblies/pkg:         12                                   **
/COM, **    Max Heat (Watts/assy):  1500.00                              **
/COM, **    Min Heat (Watts/assy):  0.00                                 **
/COM, **    Max Kinf:               1.130                                **
/COM, **    Min Kinf:               0.000                                **
/COM, **    Ave Age:                21.952                               **
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/COM, **    Ave Burnup:            42730.785                    **
/COM, **    Ave Enrichment:        3.767                        **
/COM, **    Ave MTU/assy:          0.539                        **
/COM, **                                                        **
/COM, ****************************************************************
*SET,BIN5,
*DIM,BIN5,TABLE,135,1,
BIN5( 1,1)=   780.47,   780.20,   779.93,   779.66,   779.39,   779.13,
BIN5( 7,1)=   778.86,   778.59,   778.32,   778.06,   777.79,   776.47,
BIN5(13,1)=   775.15,   773.84,   772.54,   771.24,   769.96,   768.68,
BIN5(19,1)=   767.41,   766.14,   764.89,   763.64,   762.40,   761.17,
BIN5(25,1)=   759.94,   758.72,   757.51,   756.31,   755.11,   744.09,
BIN5(31,1)=   733.64,   723.88,   714.59,   705.85,   697.49,   689.65,
BIN5(37,1)=   682.13,   674.02,   666.24,   659.22,   652.44,   645.75,
BIN5(43,1)=   639.28,   633.01,   626.94,   621.27,   615.77,   560.99,
BIN5(49,1)=   515.18,   474.02,   438.21,   406.33,   378.60,   352.73,
BIN5(55,1)=   330.21,   310.02,   291.87,   275.51,   260.76,   247.45,
BIN5(61,1)=   235.38,   224.45,   215.09,   205.69,   197.44,   144.88,
BIN5(67,1)=   118.36,   102.22,    91.17,    82.41,    75.47,    69.87,
BIN5(73,1)=    64.95,    60.51,    56.71,    53.42,    50.38,    47.53,
BIN5(79,1)=    45.00,    42.75,    40.72,    38.90,    37.15,    25.21,
BIN5(85,1)=    19.66,    16.76,    15.19,    14.26,    13.51,    13.01,
BIN5(91,1)=    12.58,    12.06,    11.61,    11.21,    10.85,    10.48,
BIN5(97,1)=    10.14,     9.84,     9.56,     9.30,     9.06,     6.62,
BIN5(103,1)=    5.29,     4.14,     3.39,     2.87,     2.48,     2.18,
BIN5(109,1)=    1.94,     1.71,     1.53,     1.38,     1.26,     1.15,
BIN5(115,1)=    1.06,    0.979,    0.910,    0.849,    0.794,    0.472,
BIN5(121,1)=   0.326,    0.245,    0.194,    0.159,    0.134,    0.115,
BIN5(127,1)=   0.101,    0.089,    0.080,    0.072,    0.065,    0.060,
BIN5(133,1)=   0.055,    0.051,    0.047,
BIN5( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN5( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN5(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN5(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN5(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN5(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN5(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN5(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN5(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN5(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN5(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN5(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN5(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN5(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN5(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN5(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN5(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN5(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN5(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN5(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN5(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN5(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN5(133,0)= 800000.00, 850000.00, 900000.00,
BIN5( 0,1)=1.0
/COM, ****************************************************************
/COM, **                                                        **
/COM, **    Assembly Type:         BWR                          **
/COM, **    Decay Period (years):  900000                       **
/COM, **    Number of assemblies:  46214                        **
/COM, **    Assemblies/pkg:        44                           **
/COM, **    Max Heat (Watts/assy): 400.00                       **
/COM, **    Min Heat (Watts/assy): 0.00                         **
/COM, **    Max Kinf:              1.000                        **
/COM, **    Min Kinf:              0.000                        **
/COM, **    Ave Age:               16.870                       **
/COM, **    Ave Burnup:            43848.642                    **
/COM, **    Ave Enrichment:        3.395                        **
/COM, **    Ave MTU/assy:          0.174                        **
/COM, **                                                        **
/COM, ****************************************************************
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*SET,BIN6,
*DIM,BIN6,TABLE,135,1,
BIN6( 1,1)=   282.60,   282.50,   282.40,   282.31,   282.21,   282.12,
BIN6( 7,1)=   282.02,   281.92,   281.83,   281.73,   281.64,   281.16,
BIN6(13,1)=   280.69,   280.22,   279.75,   279.28,   278.82,   278.36,
BIN6(19,1)=   277.91,   277.45,   277.00,   276.55,   276.11,   275.66,
BIN6(25,1)=   275.22,   274.78,   274.35,   273.91,   273.48,   269.46,
BIN6(31,1)=   265.66,   262.07,   258.65,   255.39,   252.27,   249.33,
BIN6(37,1)=   246.52,   243.60,   240.80,   238.18,   235.67,   233.19,
BIN6(43,1)=   230.79,   228.43,   226.15,   223.97,   221.86,   201.61,
BIN6(49,1)=   184.57,   169.43,   156.24,   144.58,   134.37,   125.01,
BIN6(55,1)=   116.83,   109.51,   102.94,    97.04,    91.72,    86.94,
BIN6(61,1)=    82.62,    78.72,    75.34,    72.01,    69.07,    50.40,
BIN6(67,1)=    41.07,    35.35,    31.49,    28.43,    26.00,    24.05,
BIN6(73,1)=    22.35,    20.80,    19.48,    18.34,    17.30,    16.31,
BIN6(79,1)=    15.43,    14.65,    13.95,    13.32,    12.72,     8.60,
BIN6(85,1)=     6.68,     5.68,     5.14,     4.83,     4.57,     4.40,
BIN6(91,1)=     4.25,     4.08,     3.92,     3.78,     3.66,     3.54,
BIN6(97,1)=     3.42,     3.32,     3.22,     3.13,     3.05,     2.22,
BIN6(103,1)=     1.77,     1.39,     1.13,    0.956,    0.825,    0.724,
BIN6(109,1)=    0.644,    0.570,    0.509,    0.459,    0.417,    0.382,
BIN6(115,1)=    0.351,    0.325,    0.302,    0.281,    0.263,    0.156,
BIN6(121,1)=    0.108,    0.081,    0.064,    0.052,    0.044,    0.038,
BIN6(127,1)=    0.033,    0.029,    0.026,    0.024,    0.022,    0.020,
BIN6(133,1)=    0.018,    0.017,    0.016,
BIN6( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN6( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN6(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN6(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN6(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN6(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN6(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN6(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN6(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN6(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN6(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN6(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN6(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN6(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN6(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN6(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN6(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN6(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN6(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN6(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN6(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN6(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN6(133,0)= 800000.00, 850000.00, 900000.00,
BIN6( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   119144                            **
/COM, **    Assemblies/pkg:         44                                **
/COM, **    Max Heat (Watts/assy):  400.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.370                             **
/COM, **    Min Kinf:               1.000                             **
/COM, **    Ave Age:                29.103                            **
/COM, **    Ave Burnup:             28850.029                         **
/COM, **    Ave Enrichment:         2.966                             **
/COM, **    Ave MTU/assy:           0.178                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN7,
*DIM,BIN7,TABLE,135,1,
BIN7( 1,1)=   148.02,   147.98,   147.94,   147.90,   147.86,   147.81,
BIN7( 7,1)=   147.77,   147.73,   147.69,   147.65,   147.61,   147.40,
BIN7(13,1)=   147.19,   146.99,   146.79,   146.58,   146.38,   146.18,
```

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BIN7(19,1)=   145.98,   145.79,   145.59,   145.39,   145.20,   145.01,
BIN7(25,1)=   144.81,   144.62,   144.43,   144.24,   144.05,   142.28,
BIN7(31,1)=   140.60,   139.00,   137.48,   136.01,   134.60,   133.26,
BIN7(37,1)=   131.96,   130.62,   129.32,   128.09,   126.91,   125.74,
BIN7(43,1)=   124.60,   123.49,   122.41,   121.36,   120.35,   110.59,
BIN7(49,1)=   102.23,    94.72,    88.10,    82.20,    76.98,    72.19,
BIN7(55,1)=    67.96,    64.15,    60.72,    57.62,    54.82,    52.29,
BIN7(61,1)=    50.00,    47.92,    46.09,    44.33,    42.76,    32.73,
BIN7(67,1)=    27.58,    24.40,    22.09,    20.24,    18.71,    17.43,
BIN7(73,1)=    16.26,    15.18,    14.26,    13.46,    12.70,    11.98,
BIN7(79,1)=    11.34,    10.77,    10.25,     9.79,     9.34,     6.29,
BIN7(85,1)=     4.86,     4.13,     3.74,     3.51,     3.33,     3.21,
BIN7(91,1)=     3.10,     2.98,     2.88,     2.78,     2.70,     2.61,
BIN7(97,1)=     2.53,     2.45,     2.39,     2.33,     2.27,     1.68,
BIN7(103,1)=     1.36,     1.07,    0.875,    0.740,    0.640,    0.564,
BIN7(109,1)=    0.503,    0.440,    0.390,    0.349,    0.314,    0.286,
BIN7(115,1)=    0.261,    0.240,    0.222,    0.205,    0.191,    0.109,
BIN7(121,1)=    0.073,    0.054,    0.042,    0.034,    0.028,    0.024,
BIN7(127,1)=    0.021,    0.018,    0.016,    0.014,    0.013,    0.012,
BIN7(133,1)=    0.011,    0.010,    0.009,
BIN7( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN7( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN7(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN7(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN7(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN7(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN7(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN7(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN7(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN7(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN7(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN7(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN7(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN7(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN7(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN7(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN7(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN7(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN7(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN7(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN7(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN7(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN7(133,0)= 800000.00, 850000.00, 900000.00,
BIN7( 0,1)=1.0
/COM, ******************************************************************
/COM, **                                                              **
/COM, **    Assembly Type:          BWR                               **
/COM, **    Decay Period (years):   900000                            **
/COM, **    Number of assemblies:   2387                              **
/COM, **    Assemblies/pkg:         24                                **
/COM, **    Max Heat (Watts/assy):  520.00                            **
/COM, **    Min Heat (Watts/assy):  0.00                              **
/COM, **    Max Kinf:               1.540                             **
/COM, **    Min Kinf:               0.000                             **
/COM, **    Ave Age:                12.408                            **
/COM, **    Ave Burnup:             9933.704                          **
/COM, **    Ave Enrichment:         3.585                             **
/COM, **    Ave MTU/assy:           0.170                             **
/COM, **                                                              **
/COM, ******************************************************************
*SET,BIN8,
*DIM,BIN8,TABLE,135,1,
BIN8( 1,1)=    52.29,    52.28,    52.26,    52.24,    52.22,    52.20,
BIN8( 7,1)=    52.18,    52.17,    52.15,    52.13,    52.11,    52.02,
BIN8(13,1)=    51.93,    51.84,    51.76,    51.67,    51.58,    51.49,
BIN8(19,1)=    51.41,    51.32,    51.24,    51.15,    51.07,    50.99,
BIN8(25,1)=    50.90,    50.82,    50.74,    50.66,    50.58,    49.82,
BIN8(31,1)=    49.11,    48.42,    47.76,    47.14,    46.56,    45.99,
BIN8(37,1)=    45.45,    44.89,    44.35,    43.83,    43.34,    42.85,
BIN8(43,1)=    42.39,    41.92,    41.48,    41.03,    40.59,    36.65,
```

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BIN8(49,1)=    33.25,    30.27,    27.68,    25.37,    23.35,    21.52,
BIN8(55,1)=    19.91,    18.47,    17.20,    16.06,    15.04,    14.13,
BIN8(61,1)=    13.32,    12.60,    11.97,    11.37,    10.84,     7.78,
BIN8(67,1)=     6.48,     5.78,     5.32,     4.96,     4.66,     4.40,
BIN8(73,1)=     4.17,     3.95,     3.75,     3.58,     3.43,     3.27,
BIN8(79,1)=     3.14,     3.02,     2.91,     2.81,     2.71,     2.06,
BIN8(85,1)=     1.76,     1.60,     1.51,     1.45,     1.40,     1.36,
BIN8(91,1)=     1.32,     1.28,     1.25,     1.21,     1.18,     1.15,
BIN8(97,1)=     1.12,     1.10,     1.07,     1.05,     1.03,    0.807,
BIN8(103,1)=    0.679,    0.546,    0.456,    0.392,    0.344,    0.307,
BIN8(109,1)=    0.277,    0.240,    0.212,    0.188,    0.169,    0.152,
BIN8(115,1)=    0.139,    0.127,    0.117,    0.108,    0.100,    0.055,
BIN8(121,1)=    0.036,    0.026,    0.020,    0.016,    0.013,    0.011,
BIN8(127,1)=    0.009,    0.008,    0.007,    0.006,    0.006,    0.005,
BIN8(133,1)=    0.005,    0.004,    0.004,
BIN8( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN8( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN8(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN8(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN8(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN8(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN8(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN8(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN8(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN8(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN8(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN8(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN8(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN8(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN8(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN8(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN8(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN8(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN8(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN8(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
BIN8(121,0)= 200000.00, 250000.00, 300000.00, 350000.00, 400000.00, 450000.00,
BIN8(127,0)= 500000.00, 550000.00, 600000.00, 650000.00, 700000.00, 750000.00,
BIN8(133,0)= 800000.00, 850000.00, 900000.00,
BIN8( 0,1)=1.0
/COM, ******************************************************************
/EOF
```

```
/COM, ******************************************************************
/COM, ** Assembly Heat Generation Rates: ANSYS input formats          **
/COM, ** Output of WPBIN00D, SCSI: B00000000-01717-1200-3000X Rev.000 **
/COM, **                                                               **
/COM, **    Executable File Name:   WPBIN00D.EXE                       **
/COM, **    Input File Name:        case11.wsm                         **
/COM, **    Output File Name:       finalw11.dat                       **
/COM, **    Execution Date:         08/12/97                           **
/COM, ******************************************************************
/COM, ******************************************************************
/COM, **                                                               **
/COM, **    Assembly Type:          PWR                                **
/COM, **    Decay Period (years):   900000                             **
/COM, **    Number of assemblies:   39915                              **
/COM, **    Assemblies/pkg:         21                                 **
/COM, **    Max Heat (Watts/assy):  850.00                             **
/COM, **    Min Heat (Watts/assy):  0.00                               **
/COM, **    Max Kinf:               1.000                              **
/COM, **    Min Kinf:               0.000                              **
/COM, **    Ave Age:                24.955                             **
/COM, **    Ave Burnup:             45551.424                          **
/COM, **    Ave Enrichment:         3.789                              **
/COM, **    Ave MTU/assy:           0.431                              **
/COM, **                                                               **
/COM, ******************************************************************
*SET,BIN1,
*DIM,BIN1,TABLE,135,1,
BIN1( 1,1)=   558.14,   558.01,   557.87,   557.73,   557.60,   557.46,
BIN1( 7,1)=   557.32,   557.19,   557.05,   556.92,   556.78,   556.10,
BIN1(13,1)=   555.43,   554.76,   554.09,   553.43,   552.77,   552.11,
BIN1(19,1)=   551.45,   550.80,   550.15,   549.50,   548.85,   548.21,
BIN1(25,1)=   547.57,   546.94,   546.30,   545.67,   545.04,   538.83,
BIN1(31,1)=   532.87,   527.07,   521.48,   516.03,   510.77,   505.58,
BIN1(37,1)=   500.57,   495.62,   490.83,   486.07,   481.46,   476.88,
BIN1(43,1)=   472.43,   468.03,   463.75,   459.50,   455.38,   417.06,
BIN1(49,1)=   383.56,   354.01,   327.89,   304.62,   283.81,   265.27,
BIN1(55,1)=   248.67,   233.76,   220.34,   208.23,   197.30,   187.42,
BIN1(61,1)=   178.53,   170.55,   163.20,   156.49,   150.38,   111.58,
BIN1(67,1)=    91.95,    80.12,    71.87,    65.37,    60.17,    55.92,
BIN1(73,1)=    52.14,    48.72,    45.78,    43.23,    40.85,    38.62,
BIN1(79,1)=    36.65,    34.88,    33.29,    31.85,    30.47,    21.04,
BIN1(85,1)=    16.63,    14.30,    13.03,    12.26,    11.63,    11.21,
BIN1(91,1)=    10.84,    10.40,    10.01,     9.67,     9.36,     9.04,
BIN1(97,1)=     8.75,     8.49,     8.24,     8.02,     7.81,     5.71,
BIN1(103,1)=     4.57,     3.57,     2.91,     2.46,     2.12,     1.86,
BIN1(109,1)=     1.65,     1.45,     1.29,     1.16,     1.05,    0.952,
BIN1(115,1)=    0.872,    0.803,    0.743,    0.690,    0.644,    0.371,
BIN1(121,1)=    0.251,    0.185,    0.144,    0.117,    0.098,    0.083,
BIN1(127,1)=    0.072,    0.063,    0.056,    0.051,    0.046,    0.042,
BIN1(133,1)=    0.038,    0.035,    0.032,
BIN1( 1,0)=  0.000001,     0.01,     0.02,     0.03,     0.04,     0.05,
BIN1( 7,0)=      0.06,     0.07,     0.08,     0.09,     0.10,     0.15,
BIN1(13,0)=      0.20,     0.25,     0.30,     0.35,     0.40,     0.45,
BIN1(19,0)=      0.50,     0.55,     0.60,     0.65,     0.70,     0.75,
BIN1(25,0)=      0.80,     0.85,     0.90,     0.95,     1.00,     1.50,
BIN1(31,0)=      2.00,     2.50,     3.00,     3.50,     4.00,     4.50,
BIN1(37,0)=      5.00,     5.50,     6.00,     6.50,     7.00,     7.50,
BIN1(43,0)=      8.00,     8.50,     9.00,     9.50,    10.00,    15.00,
BIN1(49,0)=     20.00,    25.00,    30.00,    35.00,    40.00,    45.00,
BIN1(55,0)=     50.00,    55.00,    60.00,    65.00,    70.00,    75.00,
BIN1(61,0)=     80.00,    85.00,    90.00,    95.00,   100.00,   150.00,
BIN1(67,0)=    200.00,   250.00,   300.00,   350.00,   400.00,   450.00,
BIN1(73,0)=    500.00,   550.00,   600.00,   650.00,   700.00,   750.00,
BIN1(79,0)=    800.00,   850.00,   900.00,   950.00,  1000.00,  1500.00,
BIN1(85,0)=   2000.00,  2500.00,  3000.00,  3500.00,  4000.00,  4500.00,
BIN1(91,0)=   5000.00,  5500.00,  6000.00,  6500.00,  7000.00,  7500.00,
BIN1(97,0)=   8000.00,  8500.00,  9000.00,  9500.00, 10000.00, 15000.00,
BIN1(103,0)=  20000.00, 25000.00, 30000.00, 35000.00, 40000.00, 45000.00,
BIN1(109,0)=  50000.00, 55000.00, 60000.00, 65000.00, 70000.00, 75000.00,
BIN1(115,0)=  80000.00, 85000.00, 90000.00, 95000.00, 100000.00, 150000.00,
```